

Railway Age

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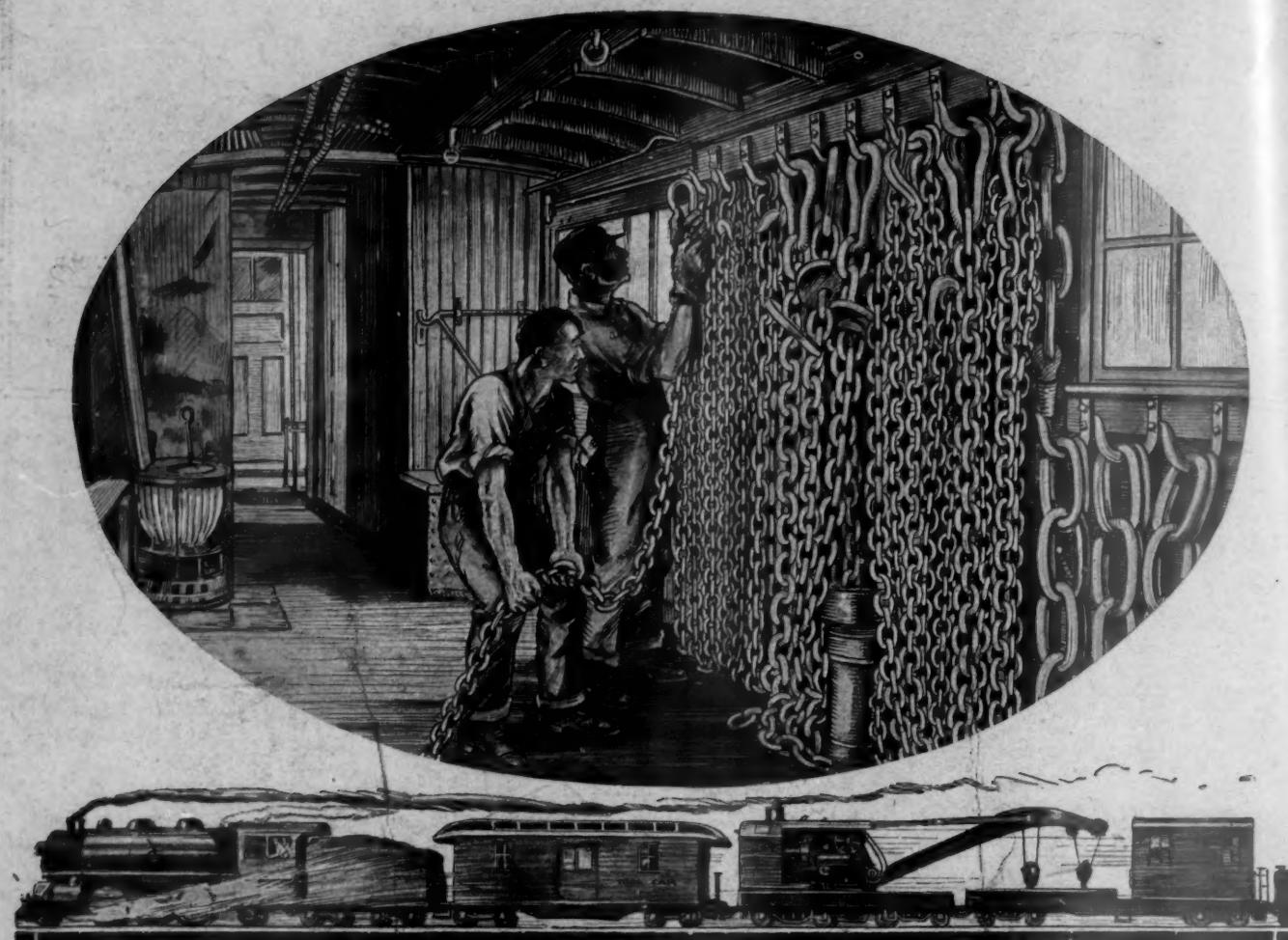
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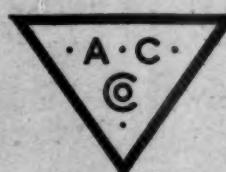
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EDITORIAL



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Advance in Subscription Rates

TO OUR READERS:

The *Railway Age*, after having made no advance for 12 years, excepting a small one to readers west of the Mississippi river, is obliged to announce this week advances in its rates of subscription. For many years our annual subscription rate in the United States was \$5 per annum. A short time ago, owing to the establishment of excessive zone postal charges, our rate to subscribers west of the Mississippi river was made \$6. Hereafter the subscription rate throughout the United States, Canada and Mexico will be \$8. The rate to subscribers in other countries will be \$10, and the price of a single copy 25 cents.

I believe that practically all our readers, knowing that the publishing business, like the railroad and all other businesses, has been subjected to large increases in its costs of production, would understand without explanation why it has become necessary for us to make these advances. There are, however, special influences affecting the publishing business about which I feel our readers should be told.

Most of our subscribers doubtless have heard from time to time that publishers of newspapers and periodicals have suffered greatly from increases in the price of paper and from shortages in the amount of it available, but probably few of them have any adequate idea of what the changes in the paper situation have meant to publishers. The white paper used by newspapers and periodicals constitutes one of the largest items in their cost of production. During the first six months of the year 1920 the expenditures for paper for the *Railway Age* and the other railway papers published by the Simmons-Boardman Publishing Company were 194 per cent greater than in the first six months of 1919. This increase in cost was due only in a small degree to an increase in the amount of paper used. It was due almost entirely

to advances in the prices that we have had to pay. On the basis of present prices the white paper used in the 52 issues of the *Railway Age* costs \$5.42 annually for each subscriber.

Even if the advance in the price of paper was the only advance in cost that we had to meet it would be serious, but it by no means stands alone. During the first six months of 1920 the expense of typesetting, press work, binding and bulk postage of our railway papers was 125 per cent greater than in 1919. During the same period the increase in the cost of the engravings used as illustrations in our editorial pages was 265 per cent.

The foregoing statistics indicate the increases which have occurred in our "manufacturing costs." We have also been affected by the same influences which have compelled business concerns of all kinds to increase the wages and salaries of their employees.

Publications of all kinds, owing to similar developments, have been forced to advance their subscription rates. Metropolitan newspapers which formerly sold for one cent are now being sold for two or three cents. Most magazines have increased their subscription rates. The *Railway Age* has been almost the last to take this action.

No publication has ever received more loyal support from its subscribers than the *Railway Age*. We have endeavored to reciprocate by publishing a paper which would be both interesting and helpful to them in their work. It will be our endeavor in the future, as it has been in the past, constantly to make the *Railway Age* a better paper, and we confidently hope not only to retain all of our present subscribers at the new rates, but to go on, as we have in the past, steadily increasing the number of our readers.

SAMUEL O. DUNN,
Editor.

At the present time when the railways are urging shippers to make every effort to secure the maximum service from the available equipment, it is highly im-

Roads Should Point the Way portant that they point the way by securing full and expeditious loading of company materials. As a step in this

direction, the Commission on Car Service urges that shipments of company materials be made in car load lots as far as possible. While it may be more convenient for the local officers using these materials to order them more frequently and in smaller quantities, present conditions are making necessary the withdrawal of many conveniences from the shippers and railway officers can expect no less. Officers of the stores department and of the operating, mechanical and maintenance departments using

these materials will do well to scrutinize their shipments to see that they are doing all and more than they expect from their patrons.

One freight station in this country recently showed a labor turnover of stokers of 66-2/3 per cent for one month.

Excessive Labor Turnover Naturally this station shows a high percentage of freight claims chargeable to improper loading and storing and shipments loaded in the wrong cars. What is wrong? Would a personnel department help to locate the seat of the difficulty and remove it?

The evidence that has been coming to this country during the past few months seems to indicate that the railways of

The British Railways Great Britain are carrying a load of worries that makes the troubles of the railways in this country small in comparison. The latest feature is the increase of passenger fares effective Au-

gust 5 and of freight rates effective September 1. These increases raise the cost of railway transportation so high above the pre-war figures that traffic is actually being driven from the railways. Between the high rates and the pronounced lessening of railway efficiency, motor transport service on the highways is rapidly increasing. Apparent by government control in Great Britain is not much more of a success than it proved to be in this country.

If supervision has been an important factor in railway operation in the past, it is doubly so now. The extent to

Supervision and More Supervision which the roads will be able to meet the heavy demands now being made on them for transportation is dependent on the amount of service they can secure from *every car*. This means

maximum loading and maximum mileage. Such a result cannot be secured by general office orders alone. Neither can it be gained by desk operation. It is only possible by intensive supervision of every detail of operation affecting the handling of traffic. It is necessary that shippers be impressed with the necessity of loading cars fully and promptly and of releasing them quickly, that yard masters and others be educated to the importance of eliminating all possible delays in movement, and that every operation be speeded up. This requires close supervision at all points. It is recognized that supervision pays at all times. It is more than an economy now, it is an absolute necessity. It is therefore important at the present time that every management consider the conditions within its own organization to determine whether it has enough supervision.

If it were not for the recent increase in freight rates and the confident expectation that the railways will soon come into

Equipment Orders in August the market for large amounts of equipment, the totals of orders for cars and locomotives placed in the month just past would be somewhat disconcerting.

The orders reported in the Equipment and Supplies column of the four issues of the *Railway Age* during August totaled only 14 locomotives and 6,176 freight cars for domestic service. Of the freight cars considerably more than half were included in an order for a private car line—namely that of 3,900 for the Union Tank Car Company. The figures for the first eight months are as follows:

	Locomotives		Freight cars		Passenger cars	
	Dom.	For.	Dom.	For.	Dom.	For.
January	32	213	2,220	1,080	7	..
February	378	86	6,392	516	35	..
March	260	71	10,136	625	240	..
April	469	108	23,528	350	373	..
May	202	9	7,402	207	107	22
June	69	50	3,757	375	..	..
July	97	77	5,732	52	60	10
August	14	24	6,176	940	..	..
Total	1,521	638	65,343	4,145	822	32

From this table it will be seen that August has been the lowest month so far this year. On the theory that night is darkest before dawn, daybreak should not be far ahead of us. In view of the new conditions under which the railways are operating, there is every reason to expect that the remaining months of the year will show a considerable improvement over the three summer months.

Efforts to restore the old-time spirit of loyalty among railway employees will direct renewed attention to the pension system from which some of the railroads have obtained no little benefit through improved *esprit de corps*, faithful service and reduced labor turnover. The benefits to the employee are,

of course, obvious. However, the decreased value of the dollar which has been such a disturbing influence in all phases of our national life has worked also to the acute disadvantage of the pensioner. Like a man who has retired from active employment to live from the proceeds of a small competence, the railway employee who was superannuated prior to the war now finds that his resources are only half of what they were at the time of his retirement. The old pensioner feels this situation all the more keenly because employees retiring since the wage increases are generally receiving proportionately larger pensions. This situation has in many cases resulted in actual hardships and points to the necessity for some form of relief. A number of the roads have this matter under consideration and at least one has authorized increases in the pension. The plan proposed on one railroad is to recalculate the pensions granted in antebellum days on the basis of the higher wages paid subsequent to the employees' retirement.

With a train movement not approaching capacity a railroad may be operated without signals with a fair degree of safety,

One Means of Increasing Track Capacity but operation at maximum capacity with a satisfactory degree of safety is practically impossible without block signaling and the degree to which this capacity may be attained depends upon the kind and character of signaling installed. The principal element of a block system that affects the capacity of a line is the length of block, which is evident in a comparison between the manual and automatic systems. A study of this point made recently by one road showed that the installation of automatic block signals in place of the controlled manual system in use, would increase the capacity of the track for passenger trains two and one half times, for fast freight trains somewhat more and for slow freight trains nearly three times. About 38,000 miles of road in the United States is now equipped with automatic block signals and about 63,900 miles with non-automatic signals of which only 1,543 miles consists of the controlled manual system and the remainder includes the use of the telegraph, the telephone and electric bells for blocking. Each year a certain mileage of automatic block signals is installed in place of the non-automatic system. However, it is quite possible that the replacement would be much greater if more extended study were made to determine the benefits which might be procured by the installation of automatic signals on those sections of road now equipped with non-automatic protection, particularly where it is generally known that the present capacity has been reached.

Signaling, both automatic and interlocking, when wisely installed, begins to produce economy from the first day of its

Economy and Safety operation; the immediate saving of money is full justification. But emphasis on this point, in recent notes in this column, must not be allowed to obscure the twin argument, increased safety. Arguments for safety—which today means, in many cases, extreme refinement—often seem to be arguments for future saving as against present saving; and the present always presses hard in every budget discussion; but it is

important to cut out that word "against." "And" is the proper word. Problems of safety and future economy are constantly with us; a score of them in the government report on accidents noticed September 3, page 407. These accident records illustrate both extremes, and everything in between. At Schenectady, June 9, (see report in this issue) all usual safeguards were present, even to a flagman who was fairly efficient; who did about all that could be expected of him. Improving the engineman or supplementing his brain by more or better machinery is the only remedy in sight. At South Chicago, on the other hand (*Railway Age*, September 3, page 406) six men were reported as negligent or culpable, and any one of the six could probably have prevented the collision. At Acme, Ill., on July 3 (see report in this issue) the government inspectors found disregard of rules as flagrant as at South Chicago. The disquieting query that arises in the reader's mind is, How often do hazardous combinations of this kind occur which are providentially prevented from killing anybody and which, therefore, are concealed from the public? Provision against this kind of danger has to be prepared long beforehand.

Experience is a good teacher, but how many years does it require an engineer to learn how to manipulate the throttle and reverse lever in the best interests

The Fourth Fuel of fuel economy? How long does it Commandment: take the average fireman to discover

Instruction: the advantage of a thin fire and avoidance of a rake, if he ever does?

Could not the railroads anticipate much of this early experience by a broad plan of education? Through lack of proper instruction many enginemen acquire habits in the early stages of their experience which no degree of *supervision*, as described in the second fuel commandment, nor amount of incentive as suggested in the third fuel commandment, can wholly eradicate. *Organization* as outlined in the first fuel commandment must make some provision for the education of all enginemen, particularly the younger men as these enter the service or are promoted to running. *Instruction* may be regarded as the fourth fuel commandment. The handling of the reverse lever has a tremendous effect on fuel efficiency and recent tests have demonstrated that there is a certain cut-off on each locomotive which at various speeds will give the best results. Railroads should ascertain the proper cut-off and instructions to engineers on this point should be explicit. The least that any railroad can do for its firemen is to describe the process and explain the principles of good firing. An instruction car designed for this purpose would be an asset on any large railroad despite the fact that results from educational work conducted in this manner may not be immediately apparent. What is most needed is direct instruction in the locomotive cab by men not only capable of *telling* the inexperienced fireman what to do, but capable of *showing* the fireman how to do it.

Despite the fact that the successful operation of American railroads is highly dependent on statistics, surprisingly few

Statistics, Dead or Alive? statements are compiled in a form that carries a direct appeal to the employees upon whom results are wholly dependent. Generally they are elaborate and involved, and it often requires consider-

able ingenuity to discern the conditions that are in reality indicated. It is true that statistics can only represent something that has happened, but it is also true that they should indicate *why* this happened and what may be expected to happen if certain specific conditions are not radically al-

tered. It is not sufficient to note the unsatisfactory conditions of last month, or last year; the figures should clearly indicate all of the contributing causes. Not only this, but where a condition is susceptible to improvement the record should be of a character to inspire a better effort in every individual whose work can in any way influence the result. Where statistics do this they are of inestimable value to the railroads. Figures that show plainly what each division organization has done to improve car and train loading will work wonders; figures that show the relative efficiency of each engine terminal and describe definitely the time locomotives are delayed at these terminals by both the mechanical and the transportation department cannot fail to improve the terminal situation if given publicity; bulletins that indicate the real fuel efficiency of individual locomotives or locomotive engineers, if placed in the hands of these men, will save fuel no matter how ample or how meagre your mechanical facilities may be. If statistics are to fulfill their greatest mission they must be of a character to convey a meaning to every employee—they must be vivid, even graphic if necessary. They must be something more than a post mortem over which we mourn our past, or even, as the handwriting on the wall, through which we see our downfall. Statistics, to be productive of the best results, must be made a live factor, possessing an intimate touch on every phase of railroad operation.

Supervisory officers of the maintenance of way department are recruited according to two distinctly different policies. Most

Where Are the Supervisors Coming From? roads have always selected their supervisors from the rank of foreman; a few have drawn them from the engineering forces. The first, or older,

method is founded on the principle that experience is the best and surest teacher, and affords opportunity for a recognition of natural leadership and capacity for responsibility in a way that should permit of small chance for error. The second method is based on the idea that maintenance of way work consists largely of engineering problems and that technical training enables the officer to solve them by direct analytical attack rather than through the haphazard application of past experience. It has the further advantage of giving a large group of engineers the best possible training for promotion to executive positions in the maintenance of way department. Both methods have given excellent results, although sporadic attempts to apply the second plan on roads definitely committed to the first have frequently resulted in failure. At any rate, the high grade of supervisory officers developed in the past by recruiting from the rank of foreman has served to deter most roads from attempting any change in policy. However, a new factor has gradually been brought to bear on this situation. For a number of years maintenance of way officers have complained of the lack of suitable material for the selection of foremen. As a result of this a large part of the gang leaders, especially in the east, are now of foreign birth and many of them use the English language with difficulty, if at all. It has even been necessary to give some foreman an assistant or place a timekeeper in the section gang to perform the foreman's simple clerical duties. This condition obviously reduces the field from which to draw supervisors selected purely from demonstrated native ability. Therefore, unless at least a part of the supervisors are recruited from other sources, the supervisory personnel is bound to depreciate. In view of this situation, and the fact that maintenance of way work on the railroads has gradually become so complex as to demand the greater application of engineering knowledge, it appears highly important to give further thought to the employment of technically trained men.

The Railroads and the Coal Situation

WE PUBLISH ELSEWHERE in this issue an interesting article by Eugene McAuliffe, of the Union Colliery Company, in which in reply to an article recently published in the *Railway Age*, he discusses the relations between the railways and the coal industry, and especially the extent to which the way the railways have been managed is responsible for the present coal situation.

In the article published in the *Railway Age* a few weeks ago, to which Mr. McAuliffe refers, it was contended that the principal cause of the present shortage of coal was not the failure of the railways to move more coal since January 1, although this has been one of the causes, but that the principal cause was lost production caused by the strike in the coal mines last November and December. Mr. McAuliffe goes back farther into history. He says the insistence of the Railroad Administration in the early part of 1919 that it should not be required to pay the coal prices fixed by the Fuel Administration caused a reduction of production in the early part of 1919, and implies that this created a shortage of coal.

Undoubtedly he is right in his contention that the attitude of the Railroad Administration was largely responsible for the large reduction of production which took place in the early part of 1919. At the same time, Mr. McAuliffe says that if the railways had moved 20,000,000 more tons of coal in the first seven months of 1920 we should not be confronted with the danger of a coal shortage. Doubtless he is right in this. But suppose that the coal strike had never occurred and that last November and December 44,000,000 more tons of coal had been produced and transported than actually were. Then, on Mr. McAuliffe's own theory, the railways could have transported over 20,000,000 tons of coal less than they actually did in the first seven months of the present year, without there being any coal shortage.

The view expressed in the article in the *Railway Age* to which Mr. McAuliffe replied was, that while transportation conditions were partly to blame for the coal shortage it was not true, as has been repeatedly charged by the National Coal Association, that transportation conditions were entirely to blame, and the facts cited by Mr. McAuliffe support this view. The only ground upon which the coal operators can maintain that transportation conditions are entirely to blame for the present coal shortage, is that the railroads should be prepared at any time to make up within a few months any deficiency in the country's coal supply, however enormous, which may result from failure of production due to a strike in the mines or to any other cause or causes for which the railways are not responsible. This, we think, would hardly be regarded as tenable ground.

Mr. McAuliffe estimates that at present a production of 550,000,000 tons of bituminous coal annually is necessary to supply the country's needs. Since the amount of coal produced and transported in the first seven months of the year was 302,739,000 tons, he estimates that during the last five months of the year there should be produced and moved 247,261,000 tons, or an average of 11,681,682 tons a week. The *Railway Age* maintains that the necessity for such a rate of production and transportation in the last five months of the year is not due to any derelictions on the part of the railways. At the same time, we also maintain that the railways can and will transport the required amount of coal if the coal mine operators will keep their mines open and running and railway labor will perform its duty to the railways and the public in a reasonable manner. In the week ended August 14 the amount of coal which actually was produced and transported was 11,813,000 tons, in the week ended August 21, 11,048,000 tons, and in the week ended August 28, 11,674,000 tons. The figures show that in the month of August the railroads actually were moving approximately the amount of coal which, on Mr. McAuliffe's

estimate, they must move weekly in order during the present year to supply the amount of coal the country needs.

Mr. McAuliffe implies that railway managers have not in the past shown the zeal for moving coal that they should. We might reply that for many years the coal operators manifested no zeal for supporting the railways in their efforts to get rates and earnings which would enable them to provide the cars and other facilities required to enable them to move sufficient coal. But, as Mr. McAuliffe implies, it is time that the railroad and the coal industries should quit antagonizing and abusing each other and begin seriously to work together. The National Coal Association recently suspended the work of throwing mud at the managements of the railways, in which it had been engaged for some years, and appointed a committee to co-operate with a committee of railway executives in working out a plan for improving the coal situation. The results have been excellent and the amount of coal produced and transported has been greatly increased. The two sections which were in the greatest danger of serious fuel shortages were the Northwest and New England. For some time now the coal operators and the railways have been keeping to the schedules for the movement of coal to these sections which they adopted.

The railways are the largest customers of the coal operators. The coal operators are also the largest customers of the railways. In their own interest they ought to work harmoniously and closely together. They should do it also in the interest of the public. We publish Mr. McAuliffe's article in order to give railway officers a better understanding of the coal operators' point of view regarding the coal situation. If the mine operators and the railway managers will get each other's points of view intelligently and work together, instead of constantly pulling apart, the results will be better for all concerned.

Why Do Not Railway Employees Buy American Railroads?

THE PROPAGANDA for government ownership and employees' management of the railways is still being carried on. It is merely a part, but an important part, of the Bolshevik crusade for the destruction of "capitalism" and the establishment of the political and economic rule of the proletariat which is being conducted by radical agitators throughout the world. Among the projects being specifically agitated in the United States is government ownership and employees' management of the coal mines as well as of the railroads. The radicals are distributing literature everywhere telling the manual workers that they create all wealth, and that the capitalists exploit them through the alleged enormous profits derived from the ownership of private property.

That many railway employees accept this doctrine is shown by the fact that they are continuing to contribute to the expenses of the Plumb Plan League and to the distribution of its official paper. The *Railway Age* once more raises the question, if the railway employees really believe that those who own the railways derive immense profits from them, and that employees' management would greatly increase efficiency of operation and thereby increase profits, why do they not themselves buy the railways instead of agitating for the American public to buy them?

This question has been given increased pertinency by the advances in the wages of railway employees which recently have been made. The wages now being paid to them amount to about \$3,600,000,000 a year. The advances granted to them recently by the Railroad Wage Board amount to \$625,000,000 a year. They easily could and should save at least this part of their annual incomes. Why do they not do this and adopt a co-operative plan, through their labor

organizations or otherwise, for acquiring the ownership of railroads?

The total par value of railroad stocks outstanding in the hands of the public on December 31, 1917, as reported by the Interstate Commerce Commission, was \$6,583,000,000. The saving by the railway employees of the recent increase in their wages would give them \$625,000,000 annually for investment. On this basis, if they bought at par they could easily, by investing all their savings and their dividends on their savings in railway stocks, become owners of \$3,490,000,000, a substantial majority of all the stock outstanding within five years.

But they would not have to pay par. The average price at which the stocks of twenty-five large railroad systems were bought and sold in the open market last week was \$58.50. Taking this as the average market price at present of the railway stocks outstanding, all the stock could be bought for \$3,851,000,000, and one-half of it, or enough to give absolute control, could be bought for \$1,926,000,000. On this basis the railway employees, by saving and investing their recent increase in wages in railroad stocks, could acquire ownership of a majority of the stock of all the railroads within three years. Of course, an extensive buying movement would cause the prices of railway stocks to rise, but it is a conservative estimate that by investing their recent increase in wages in stocks the employees could secure absolute control of the ownership of all the railways in from three to five years.

If the co-operative organization which we have suggested the employees might form did not wish to invest in the stocks of all the railways simultaneously, it could acquire first one railway and then another. For example, the total outstanding stock of the New York Central Railroad is \$250,000,000. The total outstanding stock of the Atchison, Topeka & Santa Fe Railroad is \$346,000,000. The stocks of both companies are selling below par, but even if par had to be paid for them the railway employees of the United States could buy the whole of the stocks of both companies with that increase in their wages within a single year and have a comfortable margin left to invest in securities of other companies. The combined outstanding stock of the New York Central and the Pennsylvania in the east, and the Atchison, Topeka & Santa Fe and the Union Pacific in the west, amounts to \$1,417,000,000. If the employees desired to acquire control first of the ownership and management of only these four great properties they could buy a majority of the stocks of all of them at par with their recent increase in wages in 14 months.

The financial power of the employees of the railways would be enormous if they would save a comparatively small part of their wages and invest them in securities. The same thing is true of the workers in all other lines of industry. Why should they carry on propaganda to get the public to tax itself to buy and turn over to working men the management of the industries in which they are engaged when it would be within the power of the working men to acquire both the ownership and management of all the industries they are engaged in if they would only practice the thrift in their expenditures upon which has been originally founded the fortune of every man who ever advanced from wage earner to capitalist, or from farm hand to farmer?

If the public should tax itself to buy the railways and other industries and then turn them over to the employees to manage for their employees' own benefit the public would take all the risks of loss, while the employees would get practically all the benefits, if there were any benefits forthcoming. On the other hand, if the employees of the railways and other industries should save their own money and buy control of these industries they would themselves take the chances of loss as well as get the opportunities of profit. The propagandists of the Plumb Plan and of Bolshevism say, how-

ever, that the opportunities for profits are enormous and that the exploiting capitalists are now getting huge profits. If the opportunities for profit are so great and working men are so sure that their management of industry would be more efficient than that of the capitalists, they should feel sure that if they saved their money and bought the capitalists out they would have just as good a chance of making large profits in the future as the capitalists would have.

Never was there a time in the history of the United States when the wages of railway employees and other workers were so large in proportion to the prices of railway and other securities as they are now. Never, therefore, were conditions so favorable for the workers to acquire financial control of the industries in which they work and show how well they could manage them. Nevertheless, never was there a time when there was so much agitation among the workers for the destruction of so-called "capitalism." It is all very inconsistent. If the workers really think they are being exploited, and want to stop the exploitation, they can easily do it by buying the capitalists out, and if they will study the present prices of railroad and other securities of all kinds they will find that never for many, many years have the capitalists been willing to sell relatively so cheaply as they are now.

Of one thing we warn the workers now, however. This is, that if they do save their wages and invest as suggested, they will soon find that the difficulty of making profits in business and the ease of incurring losses are much greater than they would ever suspect from reading the literature of the Plumb Plan League and other Bolshevik organizations!

Atchison, Topeka & Santa Fe

THOSE ROADS that entered on the period of government operation in a particularly good physical condition, weathered the two years in more than proportionately good shape. That is to say, that whereas many roads of necessity had to hold down maintenance and largely expenditures on additions and betterments because of steadily increasing costs of doing business, there were a few roads which because of their location, strong financial credit and particularly able management had continued a full program of both maintenance and betterments even during the early period of the European war. The Atchison, Topeka & Santa Fe was one of these few roads. It continued under the management of W. B. Storey, who had been vice-president in charge of operation prior to 1918, and who became federal manager. The great transportation machine, therefore, which had been the life work of the late E. P. Ripley, entered the period of government operation at almost the top point of its development and in charge of the management to which Mr. Ripley had himself entrusted it.

The road in the last full year of government operation (1919) earned gross \$209,500,000, and after the payment of operating expenses and taxes the government had a net of \$42,026,000, comparing with a rental which the government allowed the company of \$44,616,000. Since this, however, does not take into consideration \$3,191,000 additional mail pay, it fails to reflect accurately the relations of the earnings of the property and the government rental. Actually for the two years, 1918 and 1919, the government made a profit from the operation of the Santa Fe after paying expenses, taxes and rental to the owning corporation.

The property is in remarkably good physical condition. The high standards of upkeep which had been for a number of years peculiarly characteristic of the Santa Fe were adhered to in so far as materials and labor would permit, and apparently the Santa Fe fared particularly well in obtaining both labor and materials under conditions which

adversely affected many other roads. In the matter of track labor, the Santa Fe has pursued a farsighted policy which proved of great value during the period of acute shortage of common labor. It not only paid the poll tax on Mexican labor, but also paid the tax on the laborer's wife and provided excellent quarters for married track laborers. The result was that in general the Santa Fe was able to keep its gangs up to an average of about a man to a mile of track. In general, track is in the best of condition; motive power is in good condition, but the car situation was at the end of the period of government operation in somewhat the same unsatisfactory condition as on many other roads.

The total operating expenses amounted to \$156,026,000 in 1919, as compared with \$135,793,000 in 1918. The annual report to stockholders does not give details of the operations of the property under government control. Reports to the Interstate Commerce Commission are for the Atchison, Topeka & Santa Fe proper and do not include the Gulf, Colorado & Santa Fe and the Panhandle & Santa Fe, both of which are included in the report to stockholders. For the Santa Fe proper, maintenance of way in 1919 cost \$23,-

and 208,000 tons were received from connections. The grain tonnage in the Atchison's territory was even better in 1919 than in 1918, totaling 2,008,000 tons in 1919; a few tons more than in 1918. Total products of agriculture furnished 5,237,000 tons in 1919, as against 4,649,000 in 1918.

The average haul of freight on the Santa Fe is long and was even longer in 1919 than in 1918. In 1919 it averaged 347 miles for revenue freight, and in 1918, 327 miles. The revenue per ton per mile amounted to 1.251 cents in 1919, as against 1.057 cents in 1918. This increase in average revenue per ton mile, together with an increase in passenger business, as indicated by 195,000 passenger miles per mile of road in 1919, as against 166,000 in 1918, and an increase in the rate per passenger per mile of from 2.380 cents in 1918 to 2.698 cents in 1919, accounts for the increase in total operating revenues.

The loss in ore tonnage is reflected in a lower average train load of revenue freight. The average in 1919 was 499 tons as against 511 tons in 1918. Another factor in the train load beyond the control of the operating department was a larger proportion of empty cars. In 1919 the



Atchison, Topeka & Santa Fe

158,350, as compared with \$19,037,933 in 1918, and maintenance of equipment cost \$40,017,505 in 1919, as compared with \$30,100,235 in 1918. Transportation expenses amounted to \$63,140,910 in 1919 and \$56,588,997 in 1918.

It is interesting to study the operations of the road under government control even notwithstanding the fact that the figures are not directly comparable with those in previous annual reports to stockholders. Comparing now the operations of only the Atchison, Topeka & Santa Fe proper, operating in 1919, 8,650 miles, we find that the total tonnage of freight carried in 1919 amounted to 28,597,000 tons, as against a total freight tonnage in 1918 of 32,943,000 tons. Of the tonnage carried in 1919, 21,255,000 tons originated on the property itself, and 7,342,000 tons was received from connections. In 1918 there was 25,306,000 tons originating on the property and 7,637,000 tons was received from connections. The falling off in tonnage originating on the property was largely in ores. In 1919 there was but 2,625,000 tons of ore tonnage originating on the Santa Fe and 196,000 tons received from connections. In 1918, however, there was 5,176,000 tons of ores originating on the property

average number of empty cars was 12.28 per train and of loaded cars 27.91. In 1918 the average number of empties per train was 10.97 and of loads 26.17. The average loading per loaded car in 1919 was 19.66 tons, and in 1918, 21.54 tons.

The following table shows the general results of operation of the property under the government in 1919 and 1918. These figures are for the entire property, including the Santa Fe proper and the Gulf, Colorado & Santa Fe and Panhandle & Santa Fe. This is not the corporation income account:

	1919	1918
Mileage operated	11,483	11,456
Operating revenues	\$209,500,004	\$187,658,223
Operating expenses	156,026,127	135,793,059
Net operating revenues	53,473,877	51,865,164
Taxes	9,137,463	7,812,630
Operating income	42,025,618	44,206,339

The following shows the corporation income account for 1919 and 1918:

	1919	1918
Rental from the government	\$44,615,087	\$42,885,310
Other income	15,100,116	4,310,952
Gross income	59,715,203	47,196,264
Interest, rentals, etc.	11,654,259	11,696,192
Dividends and sinking fund	19,659,839	.....
Surplus	23,438,819	.....

Novel Falsework Method Used on New Haven Bridge

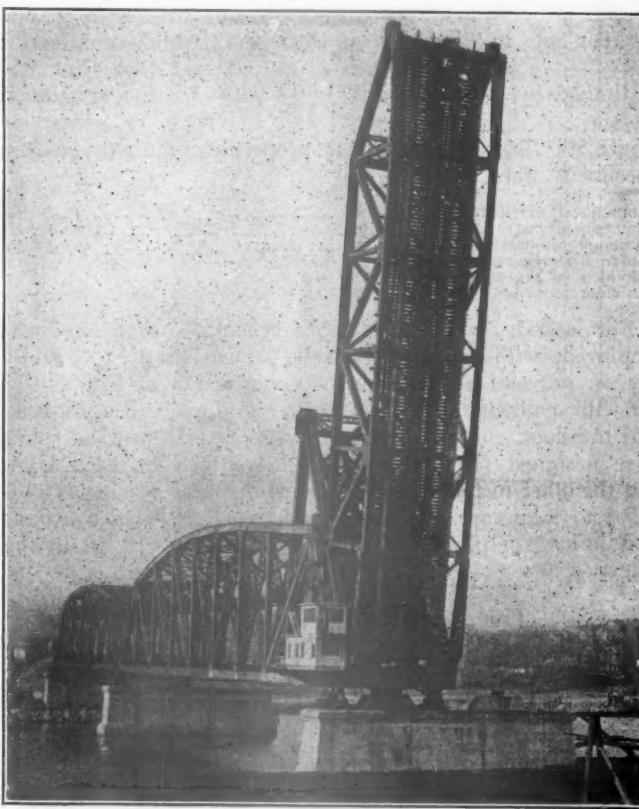
Large Structure at New London, Conn., Presented Difficult Foundation and Superstructure Problems

THE NEW YORK, NEW HAVEN & HARTFORD has recently completed a new double-track steel bridge over the Thames river at New London, Conn., which is the last of the large bridge projects undertaken or in progress during the European war. This construction was the direct result of a growing necessity for a more efficient means of handling traffic over the Thames river, and its completion has greatly facilitated the movement of trains at this point. While the structure involves nothing remarkable as to length and number of spans, height above water or tonnage of steel used, it presented an interesting and difficult foundation and erection problem because of the depth of the water and the character of the bottom. Suitable pier foundations and support of falsework were found only at depths of from 88 ft. to 131 ft. below the surface of the water. These unusual depths made it necessary to resort to the dredging-well method for three of the four piers, the pneumatic method being employed for the fourth.

The old bridge, which has been dedicated to the state for public highway purposes, consists of a steel structure with four fixed spans and a 500-ft. draw span, the latter being the longest in existence at the time of its completion. This old Thames river crossing—a landmark in New England railroading—occupies a site parallel to and 186 ft. downstream from the center line of the new bridge. It was originally a double-track structure, but, owing to the greatly increased wheel loads, it became necessary to operate it as a single-track structure with gauntlet tracks laid along the center line. It also became necessary to limit the speed over it, and these obstacles to efficient operation, aggravated further by the continued increase in traffic, proved so serious as to necessitate the construction of a new bridge.

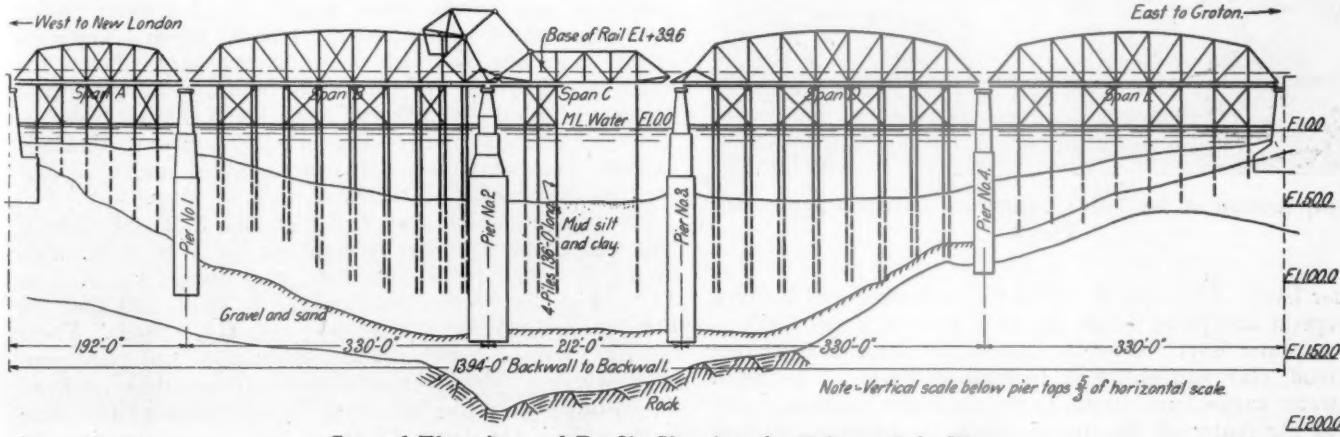
The probability that four tracks would be needed in the future made it desirable to construct a four-track substructure at once. This, under the circumstances, was the economical thing to do, for the conditions were such that it would be not only decidedly expensive but exceedingly difficult to sink piers in two separate sections at two different times. Therefore, it was decided to build a substructure

span measuring 212 ft. from center to center of piers, flanked at either end by fixed spans, the two at the east end being each 330 ft. long and those at the west end 330 ft. and 186



The Lift Span in the Open Position

ft. respectively. The fixed spans have Pratt trusses with inclined top chords, while the bascule has Warren trusses. The tracks are spaced 13 ft. center to center and the trusses



General Elevation and Profile Showing the Falsework in Place

capable of carrying four tracks when traffic conditions became such as to necessitate the addition of two more tracks.

The superstructure weighs about 5,500 tons and consists of five double-track, through riveted spans; and a bascule

32 ft. with a 22-ft. clearance over the top of rails. The under clearance of the bridge is 33 ft. 4 in. above mean low water.

A waterway 150 ft. in the clear between fenders is pro-

vided for navigation. The ends of the two adjoining fixed spans are cantilevered over the channel piers to form the support for the bascule span and to reduce its length to a minimum. The lift span is of the Strauss heel trunnion type 188 ft. long, center to center of end bearings, and this span, with its counterweight of nearly 1,800 tons, is entirely supported as regards dead load reactions, by the fixed span at the west side of the channel. The maximum angle of opening for the bascule is 82 deg. 30 min. with the horizontal.

The material for trusses, floor beams and stringers is a special alloy steel allowing working unit stresses of 22,000 lb. per sq. in., for tension members, while compression

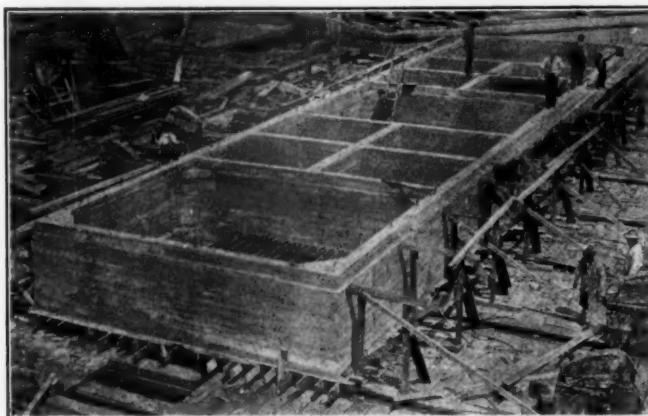
is limited by the formula $22,000 - 96$ — with a maximum of 18,500 lb. The physical properties required for test specimens were as follows:

Minimum elastic limit, per sq. in. 45,000 lb.
Minimum ultimate strength, per sq. in. 80,000 lb.
Maximum ultimate strength, per sq. in. 95,000 lb.
Minimum percentage of elongation in 8 in. equal to 1,600,000 divided by the ultimate strength.
Minimum reduction of area for material $\frac{3}{4}$ in. thick or less. 35 per cent

For laterals, portals and other bracing, carbon steel was employed, with a working stress in tension of 16,000 lb. per sq. in., and a limitation on compression of 16,000—70 l/r with a maximum of 13,500 lb. The entire bascule span and the floor, end posts and hip verticals of the fixed spans were designed for Cooper's E-60 live load on each track and the other members for E-55. Horizontal bracing is provided to take care of braking stresses and stringer expansion joints are placed at intervals of about 110 ft. in the longer spans.

The Four-Track Superstructure

Elaborate borings taken on the site of this bridge disclosed the fact that the rock underlying the whole river bed is at depths varying from 60 to 190 ft. below the low

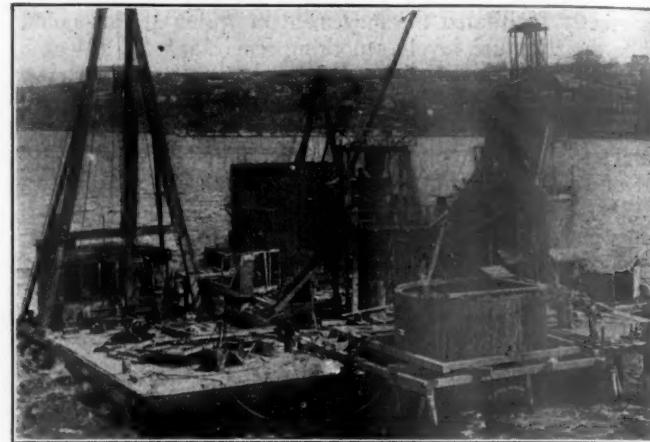


Upper Section of the Three Cylindrical Caissons Supporting Pier 4

water level. This rock is overlaid by a thick gravel blanket, except at one point where the rock rises to a point 60 ft. below water level. Over the gravel and sand is a stratum of mud, clay and shells of varying thickness. The depth of water varies from 10 ft. at the abutment locations to 50 ft. at the center of the stream, while the average rise and fall of the tide is 2.6 ft. With this information available, it was concluded that the best arrangement of the structure would be one providing for the location of one pier, No. 4, on the rock midway between the channel and the east shore where the rock foundation could be reached within the limits of the pneumatic process. The abutments were placed

where open cofferdams could be used without trouble. This, of necessity, left three piers on sites where the foundation problem was extremely difficult.

The idea of pile foundations was abandoned on account of the extreme length of the piles required, the great size of footings needed to reduce the pile loading to a reasonable figure and because pile foundations had proved unsatisfactory in the old bridge. Studies of caissons sunk by open-well dredging, which seemed to be the only available method of procedure, led to the adoption of a rectangular type of caisson with multiple dredging walls. These caissons were built with a timber shell and a reinforced concrete cutting edge shod with steel plates. The character of



Sinking Center Cylinder of Pier 4

the foundation for the various elements of the substructure is summarized in the following table showing anticipated and actual depths of foundation and the type of construction used:

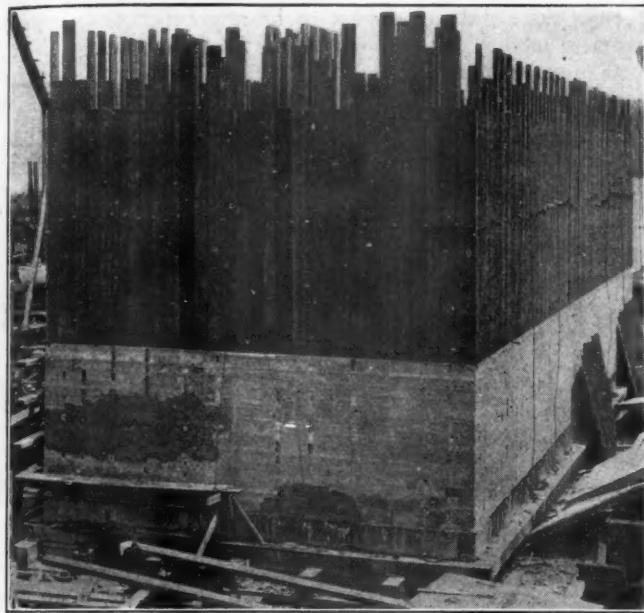
	Elevation of foundation. Maximum anticipated	Elevation of foundation as constructed	Method of construction used
West abutment..	— 40.0	— 40.0	Cofferdam, concrete seal
Pier No. 1.....	— 110.0	— 96.2	Open well dredging caisson
Pier No. 2.....	— 142.0	— 131.4	Open well dredging caisson
Pier No. 3.....	— 142.0	— 130.1	Open well dredging caisson
Pier No. 4.....	— 96.0	— 90.9	Pneumatic caisson
East abutment...	— 22.0	— 22.0	Cofferdam, concrete seal

The design of the abutments is conventional, being of the buried type with short cantilever wings on the parapet line to prevent the back fill from running over the bridge seat. The piers, as exposed above water, are of a short stocky form ornamented with pilasters at each end and protected at the water line by a belt of granite masonry. Below the water line Pier No. 4, which was built by the pneumatic process, is decidedly different from Piers No. 1, 2 and 3. The first named pier is supported on three cylindrical caissons of 22-ft. external diameter, located under each of the truss bearings of 35 ft. from center to center.

The caissons which supported Piers No. 1, 2 and 3 are of larger proportions. That under Pier No. 1 is 30 ft. wide by 94 ft. long and 81 ft. high; that for Pier No. 2 is 42 ft. wide by 99 ft. long and 111 ft. high, and that for Pier No. 3, 30 ft. wide, 94 ft. long and 111 ft. high. These caissons were of heavy timber construction and were provided with eight dredging wells which flared outward toward the cutting edge at the bottom so that the cutting edges were 6 in. wide. The lower 13 ft. of the caisson covering the dredging well was made of reinforced concrete, both for strength and to avoid the labor of framing the flares in the timber. The upper sections of the caissons were made of 12-in. by 12-in. timbers sized to $11\frac{1}{8}$ in. one way, in order to secure uniform thickness of courses.

One unique feature of the plan provided to facilitate the

sinking of the caissons was a jetting system installed in the cutting edges. This consisted of orifices, some of them pointing downward to loosen up the material and the others facing upward about 42 in. above the cutting edge proper to provide a film of water next to the sides of the caisson. The jets pointing downward and those pointing upward were supplied from separate systems of pipes, so that either form



Caisson No. 1 Ready to Launch. Note Steel Cutting Edge and False Bottom

of jetting could be used independently. However, as the material encountered was largely mud or clay, the jetting method finally used was that of an independent jetting pipe that was moved about and inserted in any well as found necessary.

The caissons were sunk by dredging through the wells,

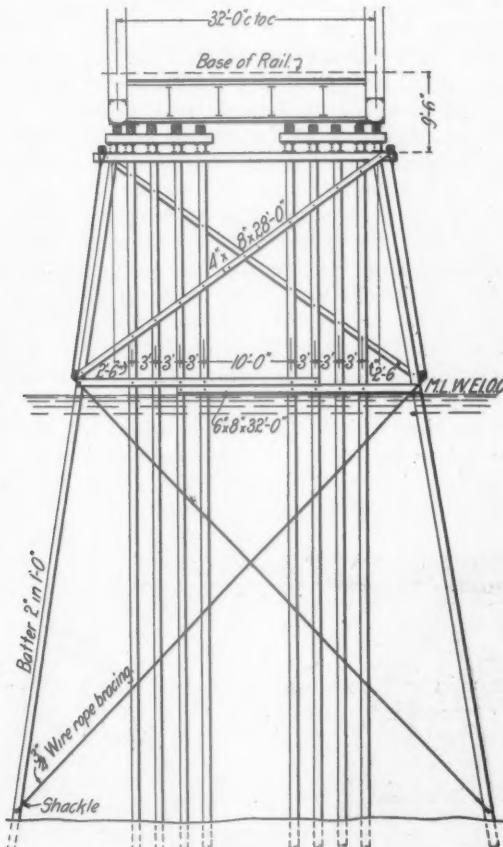


Placing the Granite Belt Courses on Pier 1

a process which undermined the cutting edges and allowed the caissons to sink. When the sinking had progressed to a point where the top of the permanent timber section approached high water level, temporary removable caisson sides were attached to the permanent caisson to form a cofferdam in which the pier shaft was built. When a satisfactory

foundation material was finally encountered, all traces of mud were removed by light dredging, repeated several times in each well. The wells were then filled with concrete, deposited through a tremie, until the level of the concrete was brought up to about 10 to 15 ft. below the top of the permanent section of the caisson. The water was then pumped out and the remaining concrete placed in the dry. The caissons showed some tendency to tilt during the process of sinking, but this was adjusted by concentrating the dredging on the high sides and by eccentric loading.

The following table gives the summarized costs of the pneumatic work on pier No. 4 and the open dredging work on Piers Nos. 1, 2 and 3, expressed in terms of the cost per cu. yd. of completed pier. These costs include all preparatory and cleaning up work, excavation and all other



Elevation of a Typical Falsework Bent

costs connected with the structure outside of the engineering expenses, preliminary studies and boring.

	Contents, cu. yd.	Cost	Cost per cu. yd.
Pier No. 1.....	10,677	\$190,368.70	\$18.00
Pier No. 2.....	21,068	287,450.63	13.64
Pier No. 3.....	14,068	227,025.57	16.14
Total for open well method....	45,813	\$704,844.90	\$15.38
Pier No. 4.....	4,928	148,892.14	30.22

The Method of Erection

The erection of the superstructure of the Thames river bridge presented many interesting features and is an example of unusual falsework erection. The east and west approaches to the bridge consisted of a four-track fill about 30 ft. deep with little room available for the storage of steel, which was scattered along the top and bottom of the fill. There was considerable navigation on the Thames river of government vessels, lighters, etc., and the channel could not be blocked for a period longer than one or two days. The distance from base of rail to mean low water of 39.6 ft., the con-

siderable amount of unstable material such as mud, silt and clay on the river bottom and the depth of water, varying from 8 to 10 ft. at the abutments to 50 ft. at the channel, influenced the scheme of erection which was adopted.

One of the more important factors determining the scheme of erection was that of the necessary location of the new bridge. Because of the main line approaches it became imperative that the new structure be located as near as possible to the old in order to avoid any increase in the degree of curvature of the approaches. On account of the pile-supported center pier of the old bridge it was only possible to secure a minimum distance of 186 ft. between the two bridge tangents at this point. This location gave rise to a peculiar situation since the arms of the old draw span, 251 ft. 6 in. long, would foul the new bridge when the draw was opened. However, clearances were such that the draw span could be opened in a counter clockwise direction as shown in the diagram, with the bascule span closed, provided the fixed span "D" was not erected and on the other hand the draw span could be opened in a clockwise direction with span "D" erected provided the bascule was opened.

From the conditions at the site, it will be noted that the erection problem consisted essentially in the erection of the bridge in such a manner as to (1) maintain an open channel at all times and (2) permit the opening and closing of the old draw span. There was to be no railroad traffic over the new bridge during its erection, as traffic was not to be diverted from the old to the new until its entire completion.

Owing to the increase in train loading on the old bridge and the necessity of using the gauntlet method of operation with its resulting delays, the New Haven required the most rapid scheme of erection. This requirement of speed in erection together with the above mentioned conditions of the problem led to the use of the following scheme:

(1) Spans "A" and "B" were erected from the New London side, at the same time erecting span "E" from the Groton or eastern side—navigation during this time was



Completing Work on Midstream Span Without Top Bracing in Shore Span

open through both "C" and "D" spans with the draw span turning in either direction.

(2) Navigation was permitted under "D" span only while the bascule span was erected in the closed position—the old draw being swung counter clockwise.

(3) The bascule span "C" was raised to the fully opened position, the draw span was swung clockwise, and navigation was diverted to the west channel so that span "D" could be erected.

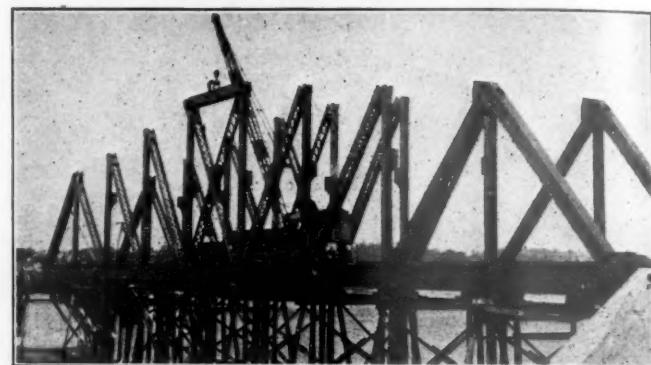
(4) The railroad traffic was diverted to the new bridge and the old draw swung clockwise with the bascule raised

until a portion of the east arm of the draw span could be cut off.

An Innovation in Falsework Construction

The four fixed spans were erected on falsework. While the distance from base of rail to mean low water, the depth of water and the depth of unstable material on the river bed were not very favorable for falsework erection, nevertheless there did not appear to be any better or more economical method for the erection of the fixed spans.

The general procedure followed in the erection of the fixed spans was to build the falsework, erect the floor system and



Placing Top Chord with a Locomotive Crane

then the trusses on it, rivet the span, swing the span free from the falsework and finally remove the falsework.

The falsework under span "A" consisted of 6-pile bents, under spans "B" and "D" of double bents of 8 piles each, and under span "E" of single bents of 10 piles each. The falsework required extra long piles, both because of the depth of water and from the unstable character of the upper sections of the mud, and silt stratum. Test piles driven at various locations showed that sufficient holding power could be secured by the stiff mud found in the deeper sections at elevations as low as 112 ft. below mean low water. This made necessary the use of piles varying in length from 60 ft. at the abutments to 136 ft. across the central portion of the structure and led to an interesting development in the falsework problem. As nearly 75 per cent of the 500 piles used in the falsework were of necessity 120 ft. to 136 ft. in length, the expense of procuring ordinary round piles would have been very great, in addition there would also have been the greatly increased cost of handling, driving and framing such long pieces. Their salvage value would, of course, have been low. As the cost of the falsework amounted to a considerable item the following method was adopted and used with thoroughly satisfactory results throughout the work of erection:

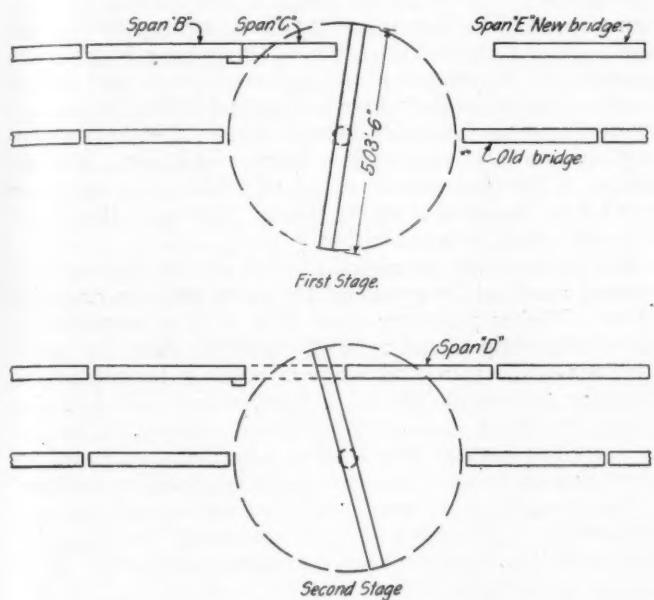
The idea of using one-piece piles was discarded and the use of sawed timber adopted. The piles used consisted of 12 in. by 12 in. long leaf yellow pine timbers varying from 24 ft. to 34 ft. long and spliced at each joint by four 4-in. by 4 in. by $\frac{3}{8}$ in. angles each 7 ft. long. A total of 28 $\frac{3}{4}$ -in. bolts were used at each splice. This method rendered the driving of the piles comparatively simple as additional lengths could be added from time to time as the piles were driven, thus obviating the necessity of handling piles of undue length. The piles were driven with a floating pile driver equipped with a 3,000-lb. hammer.

The framing of the bents was of course simplified through the adoption of the sawed timber and a very stable bent was secured. The bents with long piles were braced transversely with a system of submarine cross-bracing consisting of two $\frac{3}{4}$ -in. cables running from a point on each batter pile about even with the river bottom up and across the bent to the

cross braces and then up to the deck as shown in the section of a typical bent. The penetration of the piles in the river bottom varied from 30 ft. to 60 ft. and each carried an estimated load of approximately 12 to 15 tons.

Placing the Steel in Fixed Span and Bascule

The steel was erected with two 60-ton locomotive cranes, the floor system being first erected. Bridge ties and rail for a single track in the center of the bridge were laid as the floor was placed. The members of the trusses were then erected in the following order: The bottom chord working from the fixed end of the span to the expansion end; the



How the New Bridge Was Erected to Avoid Interference With the Operation of the Old Draw Span

posts and diagonals in any order; the end posts and shoe pins, and then the top chords working from the center toward the ends.

Most of the bottom chord sections were two panels long and were set with two cranes. All members of the trusses were handled with erection hitches permitting the direct attachment of the hoisting block to the member and thus doing away with wire rope slings or chains. After the trusses and bracing were erected, the bottom chord splices, the connections of the diagonals and posts to the bottom chords and the floor system were riveted. The spans were then swung free of the falsework by knocking out the blocking and the remaining connections were riveted up. In order to facilitate erection, the top chord bracing of the inshore spans, although free of the falsework, was not placed until the midstream spans were erected. This procedure did not lead to any trouble from the swaying of the unbraced trusses but did permit the locomotive cranes to go back and forth over the end spans without lowering their booms.

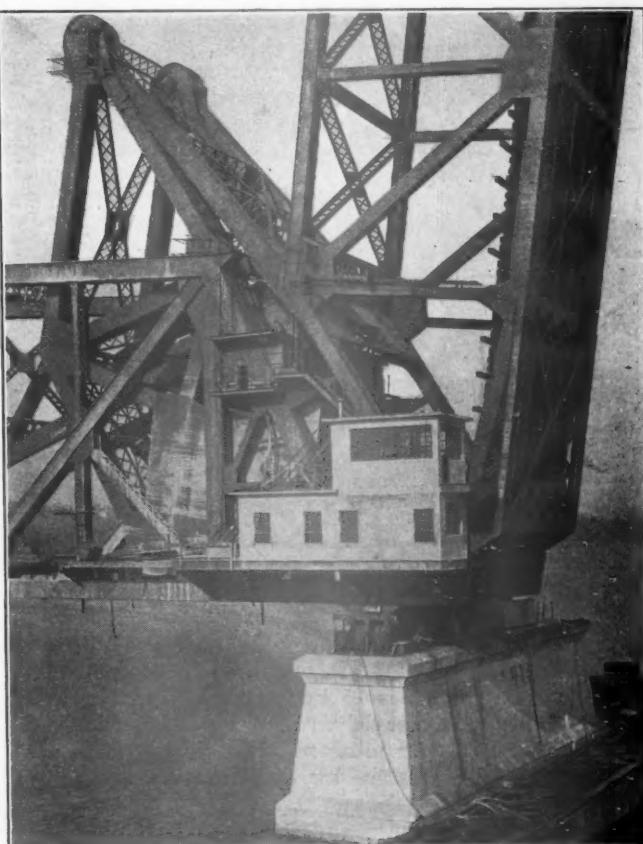
The bascule is of the Strauss heel trunnion type, and consisted of the lift itself, the counterweight truss and box, the counterweight and the operating machinery. The lift itself was erected by cantilever erection, following the usual methods for this class of work, the permanent concrete counterweight being poured as the steel was placed in order to keep it in an approximately balanced condition. However, to take care of the unbalanced moment resulting from the locomotive crane running on and off of the lift and also to permit some variation in the amount of counterweight necessary to balance, a "hold-back" or erection strut was used.

This strut, capable of taking tension or compression, tied the counterweight trusses and thus the lift itself, to one of the floorbeams of span "B." The lift span was erected with a locomotive crane, while the counterweight box and trusses were erected with a 30-ton stiff-leg derrick placed on the top chord of span "B."

The counterweight for balancing the lift span was composed of common concrete and steel punchings concrete. The common concrete amounted to 460 cu. yd., weighed about 960 tons, and contained one part of Portland cement, three parts of sand and five parts of 2-in. trap rock. It weighed 155 lb. per cu. ft. when 24 hrs. old. The punchings concrete amounted to 107 cu. yd. and weighed 460 tons. It was composed of steel punchings grouted with a mortar composed of one part of cement and two parts of sand and weighed about 318 lb. per cu. ft. In addition, about 50 tons of cast-iron, counterweight blocks were provided for adjustment.

The Operating Machinery

The bridge is electrically operated, 3-phase, 60-cycle, 2,300-volt current being furnished from the local power plant over a transmission line 1 1/8 miles in length. Three 37 1/2-kv.a. transformers step this voltage down to 440 volts



The Bascule Span Showing the Counterweights and Links

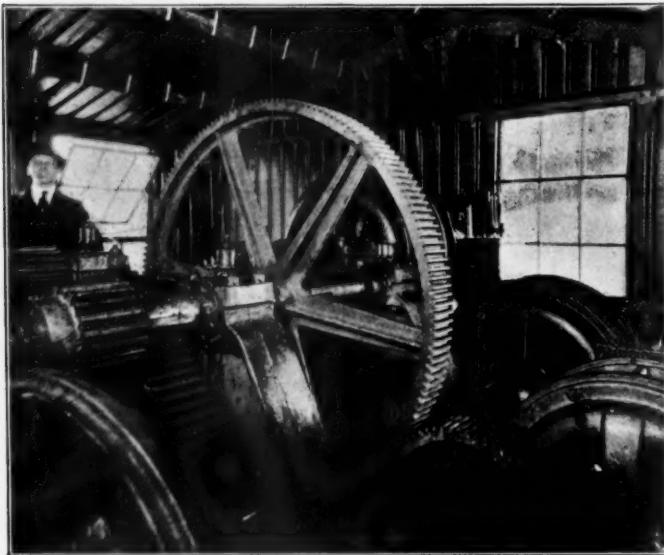
for all power purposes and for lighting it is again stepped down to 110 volts.

The machinery room containing the motive power equipment is located in a machinery house above the tracks, and is of fire-proof construction. Four 82-hp., slip-ring type motors are connected to the gear train, two of which are capable of opening the bridge in 1 3/4 min, while the other two remain in reserve. Either pair of motors may be used by closing a six-pole, double-throw switch which is mounted on the control panel. In addition to these motors, a 37 1/2-hp. auxiliary motor is provided, which will open the bridge in

nine minutes in the event of the failure of the larger motors. All motors are equipped with solenoid brakes.

The control for all motors is by magnet switches with remote control which, owing to the lack of space in the machinery room, is located in an enclosure immediately below. The master controller is located in the operator's house at the heel trunnion of the moving span, one lever controlling the lifting motors and another the lock motor. These levers are electrically and mechanically interlocked with each other and with the railway signal circuits. A foot switch releases the solenoid brakes, permitting coasting.

As an added precaution in the event of failure of the line current, a gas-engine generator set is provided which supplies current for the 37½-hp. auxiliary motor. This set consists of a six-cylinder, 82 hp. Wisconsin automobile type motor operating at a speed of 1,200 r.p.m., and direct connected to a 37-kv.a., 440-volt General Electric generator, this power unit being located on the lower floor of the operator's house. The engine is started by means of an electric motor starter controlled by a foot switch in the operator's floor; the spark and gas control as well as the dynamo control being also accessible to the operator. In case of a failure of the service supply of current, the gears can be shifted and the bridge opened and closed with the gas



Interior of Machinery House

engine generator set and gears re-shifted in 35 min. The average load on the set is 15 kw., but it is capable of delivering 40 kw. A motor-driven air compressor, with a capacity of 25 cu. ft. per min., supplies air to a 72-cu. ft. air tank at 125-lb. pressure for operating the whistle and strut brakes.

This bridge was designed and erected under the direction of Edward Gagel, chief engineer of the New York, New Haven & Hartford; W. H. Moore, engineer of structures; I. D. Waterman, engineer of construction and P. B. Spencer, resident engineer in charge of construction. Because of the serious foundation conditions encountered, outside expert assistance and advice was obtained from Ralph Modjeski, consulting engineer, Chicago. The Holbrook, Cabot & Rollins Corporation, New York, had the contract for the substructure and the American Bridge Company the contract for the superstructure, with J. B. Gemberling erecting manager, Eastern division; Herbert H. Starr, assistant engineer; David Fine, resident engineer, and Frank Stangle, general foreman. C. H. Norwood, contracting engineer, Chicago, installed the air, electric and gas engine equipment.

Re-establishment of the Railway Ticket Protective Bureau

THE QUESTION of re-establishment of the Railway Ticket Protective Bureau, organized in 1903 to detect and prosecute forgers of railroad tickets and to fight ticket scalping, is now being considered by the various passenger associations. At the time of the Bureau's organization in 1903 its object was solely to detect and prosecute forgers of railroad tickets. At that time it was not believed possible to eliminate the business of ticket scalping which was strongly entrenched and organized into several national ticket brokers' associations. The executive board of the Bureau, however, found at that time that the only definite remedy for this evil was to proceed against the entire ticket scalping fraternity by resorting to the process of injunctions in state and federal courts enjoining scalpers from buying and selling "signature" form of tickets. Later the Bureau succeeded in having state anti-scalping laws enacted in a number of states. With the coming of the government control all of its work was taken over by the Police and Secret Service Section of the United States Railroad Administration.

The necessity for the re-organization of this Bureau again becomes apparent by reason of the ticket scalpers reopening offices. Higher passenger fares offer new inducements for patronizing scalpers and reduced round-trip rates for special occasions will again find scalpers opening temporary and probably permanent offices. Furthermore, the fact that tickets are being issued non-signature, non-validation and on simplified contract forms, offers a further inducement for inexperienced persons to enter the ticket scalping business.

The situation now, insofar as the Bureau and the legal work which it has performed is concerned, has been outlined by H. A. Koach, formerly assistant to chairman of the Bureau as follows:

"(1) All injunctions secured by railroad lines that have since undergone corporate reorganization are obsolete.

"(2) Lines that have not reorganized are still protected by injunctions against such former ticket scalpers who were defendants to the original injunction and such served as so specified.

"(3) During the Bureau's existence all injunctions secured were kept active by reason of their being kept open, that is, the bonds required by the court were removed each year so that any notice of injunction could be served on any new scalper engaged in ticket business, and thus make him a party to the pending injunction.

"(4) When the railroads were taken under government control all injunctions were closed, hence only such persons defendant to the original injunction and as such served as recorded who were not parties to the original injunction, are enjoined.

"Anyone opening a ticket office to scalp railroad tickets, unless he is one of the original defendants or served prior to the closing of the injunction, must be proceeded against anew. Furthermore, anyone can handle tickets issued by such lines as have been re-organized.

Mr. Koach in further outlining his views has said "The duties performed by the Bureau's representatives covered every phase of passenger revenue conservation, hence its field was wider than generally known. A yet wider field for its activities is suggested by many railroad ticket auditors who believe that the Bureau could be made of service by the supervision of 'under cover' operatives, to ascertain the extent of withholding fares and tickets on the part of railroad employees. It is believed by these auditing officers that if general publicity were given to the fact that an organization, maintained and directed by the railroads, was in operation to give attention to an evil which has grown to large proportions in recent years, much good would result."

Overlap vs. A. P. B. for Signaling Single Track

The Merits of These Two Systems from an Operating Standpoint
Are Presented by Two Signal Engineers

TWO TYPES of automatic signaling are employed on single track lines, the overlap and the so-called absolute permissive block systems. The overlap was first used when automatic signaling for single track was developed about thirty years ago. At that time the most important consideration was to increase the safety of operation, little thought being given to the question of expediting traffic. This was the type in use up to about 1911, when the absolute-permissive block began to be installed with marked success from an operating and signaling standpoint.

The advantages of these two types of signaling were presented at a meeting of the St. Louis Sectional Committee of the Signal division of the American Railroad Association on August 20. A. R. Fugina, signal engineer, Louisville & Nashville, discussing the A. P. B. system and A. H. McKeen, signal engineer, Union Pacific System, presenting the overlap scheme. An abstract of these papers is given herewith.

A. R. Fugina on the A. P. B. System

There are a number of reasons why the use of automatic signals on single track has not grown more rapidly, but the one that perhaps hindered progress more than anything else was the shortcomings and defects in the overlap system as used with straight automatic signaling on single track. Under this scheme head-on and following movement protection is provided, but the head-on protection is limited, since it does not extend from passing track to passing track, while the circuit arrangement for following movements must be sufficient to provide much greater spacing between movements than is necessary or desirable.

There are certain inherent defects in this system which are objectionable. The one that is most apparent is that the signal indications permit two opposing trains to enter the single track between passing tracks, providing one of the trains overlooks or mistakes the meet order. With proper location of signals and overlapping the opposite trains will, of course, be stopped before coming into collision with each other, yet one of the trains will have to back up and clear the opposing train. Operating men soon recognized this defect, but in view of the fact that there was nothing better at hand it was necessary to put up with it in order to obtain the very great advantage that automatic signals offered.

Another defect which is not so apparent, and therefore not so well known by the men in the operating department, is the unreliability of the distant signal indication. When two trains approach a passing track from opposite directions one of them is likely to receive a clear distant signal indication, and under certain conditions both of the trains may receive clear distant indications, as a result of which the train, or trains, will approach the home signals, which in the meantime have assumed a stop position, without being under control, and a collision may result. Serious collisions have occurred because of this unreliability of the distant signal indication.

The Louisville & Nashville had but a small mileage of the overlap system in service on its single track. Occasionally trains received improper distant signal indications when approaching passing tracks. These occurrences lowered the confidence of the operating officers, enginemen and trainmen in the reliability of the signal indications. The paramount requirement of any scheme of signaling is that the signal indications must be reliable.

A. P. B. Signaling

Signal engineers recognized the defect in the overlap scheme for single track blocking, and about ten years ago there was a scheme devised for overcoming the objections. The protective and operating advantages gained with this new arrangement were so far in advance of anything that had been known before that the system was generally accepted and installed on those roads that were able to spend the money to install and maintain automatic signals. This system is that generally known as "absolute permissive automatic block." It provides head-on protection from passing track to passing track, and permits following movements to be made with the minimum allowable spacing between trains.

Under the A. P. B. scheme, the leaving signals at the end of a passing track are positive signals, the general practice being to equip this type of signal with a square end blade and a marker light located vertically below the indicating light. The intermediate signals, as well as the entering signals to passing track or station limits, are permissive signals, these being equipped with the pointed end blade and a marker located diagonally below the indicating light.

Operation of the A. P. B. System

When a train leaves station *A* to proceed to station *B* it automatically sets the opposing positive signal at *B* and all intermediate opposing permissive signals at *stop*. While the train is moving towards station *B* it is protected from a following movement by a stop signal and a caution signal, the control of these signals being exactly similar to the control of signals used on double track. The overlap feature for following movements is eliminated, and this permits following movements to be made with spacing that is from one-half mile to one mile closer, depending upon whether it is compared with the single or double overlap scheme. The opposing signals automatically clear up as the train passes them, thus permitting a train that may be waiting on a siding to move out and proceed in the opposite direction immediately.

When the switch at a siding located between passing tracks is opened or the main track fouled, all opposing signals for a movement from this point to either passing track are set in the stop position. As soon as the train that has been in the siding passes a clear signal it establishes its direction of traffic and all of the signals between the passing tracks assume their proper position. If a train wishes, for any reason, to return to the station from which it came, the following general rule will cover: "Whenever a train passes a signal at clear, it establishes its direction the same as though it had not changed its direction of movement."

With the A. P. B. scheme, reliable distant signal indications are assured, and, therefore, trains approaching passing tracks will always receive correct information, provided the rules are complied with. It is customary to have a double caution indication for a train that approaches a passing track or station, provided the opposing train has reached the first track circuit in advance of the passing track switch. Thus the trains are given additional information when approaching stations; this increases the safety and enables the meet to be made more advantageously. Under the overlap scheme, the protection afforded at passing tracks is the weakest part of the system, whereas under the A. P. B.

scheme this is complete. Better signal protection is also obtained for work trains that may be working between stations.

Apparatus Used and Flexibility of A. P. B.

The same kind of apparatus is used for an A. P. B. installation that is used for the overlap scheme. The circuits are quite similar, although somewhat more complicated. The system in general is much more flexible and readily lends itself to any special features that may be encountered.

The cost of installation is no greater and the cost of maintenance is on a par with the overlap scheme. One important feature in connection with the A. P. B. scheme is the use of telephones at all positive signals. These instruments are connected to the despatcher's circuit so as to enable the conductor or the engineman to get into communication with the despatcher, whenever the train is stopped by a positive signal which may be out of order. If the block is clear the despatcher may order the train to proceed. On the L. & N. a special order form is used for this purpose; it reads as follows: "You may pass absolute automatic signal No. — in 'Stop' position and proceed under control to next signal, providing your movement is not restricted by train order or time table authority." The one who receives the order signs it and drops a copy into a box located in the telephone booth.

The Modification of Rules

The L. & N. rules governing the action which is to be taken when a train approaches an A. P. B. stop signal are as follows:

522—When a train is stopped by a block signal on single track it may proceed when the signal assumes the *Clear* or *Caution* position, or if this does not immediately occur, may proceed as follows:

Where other than the "Absolute Permissive Block System" is in use, flagmen must be sent in advance immediately. Train will wait five minutes after flagman has started and then proceed through the block, keeping a safe distance behind the flagman.

522-a—A signal with a square end arm displaying at night a white marker light vertically below the light indicating the position of the semaphore arm is known as an "Absolute" automatic signal. This signal must not be passed while in the *Stop* position without authority from the chief train despatcher, except, that, if unable to communicate with the chief train despatcher, the train may, if time table and train order authority permit, proceed under protection of flag to the next block signal that is found at *Proceed* or *Caution*, as provided by Rule No. 522.

522-b—A signal with a pointed end arm, displaying at night a white marker light diagonally below the light indicating the position of the semaphore arm is known as a "Permissive" automatic signal. After a stop has been made at a "Permissive" signal indicating *Stop*, the train may proceed with caution, expecting to find a train, an open switch, a broken rail or some other obstruction in the block, except that a train moving under protection of flag from an "Absolute" signal shall continue to proceed under flag protection to a block signal that is found at *Proceed* or *Caution*, as provided by Rule No. 522-a.

Other Operating Advantages

Besides providing safer indications and increasing the capacity of the track, the A. P. B. signals have other operating advantages which are quite as valuable and important. Under the overlap scheme it is necessary to flag the block when a signal is found to be out of order. This flagging is responsible for heavy delays to trains, as the train which has to be preceded through the block by a flagman will lose

between 15 and 30 min., which in turn affects the movements of other trains, and numerous cases have been called to my attention by operating officers where the flagging of one block caused delays to the train in question, and to other trains, that ran as high as 1½ hr. On an exceedingly busy piece of single track between Henderson, Ky., and F. S. Tower, Ind., which is on trestle, frequent delays occurred with the old overlap scheme. When a train found it necessary to flag a block, the delay was multiplied by the fact that the flagging was done over the trestle. As a result, freight trains that were waiting to move at Henderson or F. S. Tower frequently were further delayed by the time of passenger or superior freight trains and it was the exception rather than the rule that these trains were delayed less than an hour, which often resulted in a "balled up" railroad. This trouble was increased when the trestle was covered with snow or ice due to thawing and freezing weather or sleet storms. At such time it was next to impossible for flagmen to walk the trestle. Finally the overlap scheme was replaced with the A. P. B. scheme, which effected a wonderful improvement in train operation. (A description of this installation appeared on page 1205 in the April 16 issue of the *Railway Age*.)

Despatchers on the L. & N. do not hesitate to permit inferior trains to keep on running ahead of superior trains, provided they know that they can get the inferior train in the clear quickly and pass the superior train by, without undue delay to it. The superior train can close in more closely because of the A. P. B. scheme of control and this, coupled with information that the despatcher obtains from the operators regarding the position of trains at the next passing track, enables the despatcher to keep trains moving with the utmost efficiency.

When a despatcher is figuring close he frequently asks the operator to observe the position of the positive signal, so that he (the despatcher) may know whether the train has left the next siding, at which there is no train order office. With this information the despatcher is given an additional advantage, which enables him to move trains up another station, which could not be done otherwise; despatchers on the L. & N. make use of this service daily and find it of great value.

A. H. McKeen on the Overlap Scheme

The first installation of automatic signals on the single track of the Harriman Lines was made in 1898. At that time little thought was given to the question of facilitating traffic; the most important consideration was to increase the safety of operation by providing a reliable means of maintaining a space interval between trains. The results of the initial installations from this standpoint were so satisfactory that further extensive installations of this type of signalling were made, principally on mountain grades, where train movements were heavy and the view obscure.

Such installations as these demonstrated conclusively that in addition to the protection secured, the movement of traffic on single track was materially expedited by automatic signals. It was found that "19" orders could be substituted for "31" orders in block signal territory, and the elimination of stops, especially of heavy tonnage trains, resulted in the movement of traffic being greatly facilitated. This practice has been continued with each additional installation of signals and is now in effect on 1852 miles of single track on the Union Pacific System.

Signals are of the two-position type with overlap control and the arrangement is such that when the adjacent switches at stations are less than 4½ mi. apart, one set of intermediate signals is installed. When this distance is 4½ to 6 mi., two sets of intermediate signals are installed. The average length of block at the entrance of stations is 1½

mi.; for starting signals at stations it is 2 mi. with a maximum length of 3 mi., and intermediate signals are spaced $\frac{1}{2}$ mi. apart. Distant signals are located $\frac{1}{2}$ mi. from the home signal approaching stations.

It is generally accepted as one of the principles of good signaling that distant indications should be displayed at reasonably uniform distance from the home signal. The A. P. B. system, in some cases, violates this principle by displaying a distant indication, varying from $\frac{1}{2}$ mi. to as much as $2\frac{1}{2}$ or 3 mi. from the home.

The absolute feature of A. P. B. as affecting opposing movements between stations, whereby one or the other of two trains will be stopped at a station, thereby obviating the necessity of one train backing up, would seem to be an exaggerated claim, due to the possibility of opposing trains entering the block simultaneously. Furthermore, in view of the extreme rarity of instances of this kind, this argument seems inconsistent. If such instances occurred with sufficient frequency to lend any force to the argument, it would indicate a laxity of operating methods not countenanced by any first-class railroad.

If all trains were run in one direction during certain periods of the day, the permissive feature for following trains might have some merit, but inasmuch as operating conditions require trains to move in both directions, it would seem that the permissive feature would only result in the bunching of trains at certain stations, where, unless ample side track room was provided, much delay would result in "sawing-by."

The Union Pacific System rigidly enforces the rule that when a home signal indicates "Stop" a flagman must precede the train on foot to the next clear signal. When a train is stopped by an absolute signal under the A. P. B. system the general practice is to secure authority from the train dispatcher to proceed, or, if unable to communicate with the train dispatcher, the flagman must precede the train. The question then arises as to how far the flagman should precede the train when the absolute home signal at the outgoing end of a station is at stop and the next intermediate or permissive signal is also at stop. If the train picks up the flagman at the intermediate signal and proceeds under control it is liable to meet an opposing train that has been delayed a few minutes after entering the block on a clear signal. By establishing two different kinds of home signals, a complication in the rules governing trainmen in the observance of signals is created. Furthermore the train dispatcher does not always know to a certainty whether or not the block is occupied, and the correctness of such information could not be relied upon.

The A. P. B. system is necessarily more complex than straight automatic on account of the additional relays, line wires, track circuits, circuit breakers, etc. Dependence is placed on back contacts to restore the circuits. These features add to the cost of installation and maintenance. A maintainer will necessarily have to be above the average in experience and ability to maintain the required close adjustment of apparatus and to successfully locate and correct the causes of failure. The simplicity of circuits and the minimum of apparatus required with straight automatic signaling certainly tends toward lower costs of installation and maintenance together with greatly increased reliability and efficiency.

The benefit of temporarily cutting off the overlap for following movements may be of some advantage where a block is much longer than the average, but where stations are close together and the block length therefore comparatively short, there appears to be no benefit in further reducing the block length. In cases where the block is long, the desired flexibility can just as well be secured by installing an additional set of intermediate signals.

Train Accidents in May*

THE FOLLOWING is a list of the most notable train accidents that occurred on the railways of the United States in the month of May, 1920:

Collisions							
Date	Road	Place	Kind of accident	Kind of train	Killed	Injured	
2	N. Y. N. H. & H.			P	0	0	
7	Mo. Pacific	Torrington	xc	P	0	0	
9	Southern	Hope	bc	P & F	0	54	
19	Southern Pacific	Bertha	bc	P & P	9	101	
23	Md. & Pa.	Tallapoosa	bc	P & F	1	11	
†31	St. Louis-S. F.	Woodstock	bc	P & F	2	1	
		White Oak	bc	P & P	5	17	

Derailment

Date	Road	Place	Cause of derailment	Kind of train	Killed	Injured
9	Pennsylvania	Portage	...	P	0	2
16	N. C. & St. L.	Vinings	...	P	0	4
17	Int. & G. N.	College	ms.	P	0	0
21	A. C. L.	Fayetteville	d. frog	P	0	11
22	Pennsylvania	Collinsville	unx.	P	4	0
23	Los Angeles & S. L.	Latimer	ms.	P	2	30
25	Atchison, T. & S. F.	La Joya	d. track	P	0	7
25	Texas & Pac.	Silver Lake	d. track	P	0	18
30	Erie	Jersey City	acc. obst.	P	3	10
†31	Lehigh Valley	Van Etten	acc. obst.	P	0	1

Other Accidents

Date	Road	Place	Cause of derailment	Kind of train	Killed	Injured
26	Mich. Cent.	Bay City	boiler	P	2	1

The train involved in the accident on the New York, New Haven & Hartford at Torrington, Conn., on the morning of the 2nd, was southbound passenger 1235. Moving at about 25 miles an hour on a curve, the train was thrown into a side track and three freight cars on the siding were wrecked. The switch had been misplaced by a boy 16 years old who was subsequently arrested. No persons were injured.

The trains in collision on the Southern Pacific at Bertha, Or., on the 9th, were local electric passenger trains, 107 and 124. Six passengers and three employees were killed and 91 passengers and 10 employees were injured. The engineman of the eastbound train was killed. This train had run past its meeting point. The collision is reported in more detail in another column.

The trains in collision on the Missouri Pacific, near Hope, Ark., on the night of the 7th were southbound passenger No. 233 and a northbound extra freight. Both engines, three freight cars and three cars of the passenger train were damaged. Fifty passengers and four trainmen were injured. The collision was due to negligence on the part of the freight train, which, because of unexpected delay, encroached on the time of the passenger train, yet did not send a flag ahead.

The trains in collision on the Southern Railway near Tallapoosa, Ga., on the 9th, were eastbound passenger No. 30 and a westbound work train. The workmen on the work train were in a car ahead of the locomotive and one of these men was killed. Two passengers, a trainmaster, one fireman, one flagman, and six laborers were injured.

The trains in collision on the Maryland & Pennsylvania near Woodstock, Md., on the 23rd, were a northbound passenger and a southbound freight. Both locomotives were badly damaged. The engineman of the passenger train was killed and the fireman of the freight was fatally injured. The fireman of the passenger train was scalded. The cause of the collision was failure on the part of the freight train to properly protect by flag.

Trains in collision at White Oak, Okla., on the 31st, were southbound passenger No. 403 and northbound passenger

* Abbreviations and marks used in Accident List:
 re, Rear collision—bc, Butting collision—xc, Other collisions—b,
 Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open derailing switch—ms, Misplaced switch—acc.
 Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P. or Pass., Passenger train—F. or Ft., Freight train (including empty engines, work trains, etc.)—Asterisk. Wreck wholly or partly destroyed by fire—Dagger, One or more passenger killed.

No. 112. The southbound train was badly wrecked, but the other consisted of steel cars, and these were not thrown off the track. One passenger, a news agent, a mail clerk and both enginemen were killed, and ten passengers and seven trainmen were injured. The collision was due to mistake or neglect on the part of train 403 in connection with train orders.

The train derailed near Portage, Pa., on the afternoon of the 9th was westbound passenger No. 27, second section.

The train derailed on the Nashville, Chattanooga & St. Louis near Vinings, Georgia, on the 16th, was the southbound Dixie Flyer. The engineman and fireman were injured.

Train derailed on the International & Great Northern near College, Texas, on the 17th, was southbound passenger No. 15. The engine and first two cars were badly damaged and the smoking car was overturned, at a misplaced switch. Four passengers were injured.

The train derailed at Fayetteville, N. C., on the 21st, was northbound passenger No. 34, consisting of an engine and six cars. The locomotive was not derailed but the second car of the train was thrown off the track by a defective frog, and, with the rest of the train, ran about 1,500 ft. on the ties, in this distance crossing the bridge over Cape Fear River. The whole train cleared the bridge but did not fall down the bank. When the derailment occurred the train was running at about 30 miles an hour, but no person was seriously injured.

The train derailed on the Pennsylvania lines at Collinsville, Ohio, on the 22nd was a southbound local passenger. Four cars fell down a bank. Nine passengers and two trainmen were injured. The cause of derailment was not determined.

The train derailed at Latimer, Utah, on the 23rd was southbound passenger No. 3. The locomotive and first two cars were ditched and the engineman and fireman were killed. The derailment was due to a misplaced switch.

The train derailed at LaJoya, N. M., on the 25th, was northbound passenger No. 808. The locomotive was derailed at a point where the roadbed had been softened by a flood, and the whole train was ditched. Two coaches were partly submerged. The engineman and fireman were killed and thirty passengers were injured.

The train derailed at Silver Lake, Tex., on the 25th, was eastbound passenger No. 22. Two sleeping cars were overturned and seven passengers were injured. The derailment was due to distortion of the track by solar heat.

The trains involved in the accident on the Erie, near Jersey City, N. J., on the 30th, were westbound local passenger, moving on parallel tracks at low speed. One of the trains was derailed by a casting which obstructed a switch and the locomotive fell against a coach of the other train. Seventeen passengers were injured. The engineman of the overturned locomotive was scalded.

The passenger train involved in the accident on the Lehigh Valley at Van Etten, N. Y., on the 31st, was eastbound No. 6. The leading engine of a westbound freight train had been derailed in the yard by a part of the tender brake-rigging dropping and wedging between guard and stock rail at a switch, and the second engine was derailed and overturned so as to lodge on the eastbound track. The passenger train came along a few minutes later at high speed and was derailed, the engine and two cars being overturned. One passenger, the engineman, and the fireman were killed and ten passengers were injured.

The train involved in the accident near Bay City, Mich., on the 26th, was a southbound passenger. The locomotive was wrecked by the explosion of its boiler, the engineman and one other employee were killed and the fireman was injured. The explosion was due to low water.

Electric Car Accidents—At Bertha, Oregon, on the 9th, a butting collision of electric trains on the Southern Pacific resulted in the death of six passengers and three employees and the injury of 35 passengers and three employees. Near Waynesboro, Pa., on the 22nd an electric car on a mountain line became uncontrollable and ran away, and four cars were wrecked; the manager of the road was killed and fifteen persons were injured.

The Tool Foremen's Convention

THE TENTH ANNUAL CONVENTION of the American Railway Tool Foremen's Association was held at the Hotel Sherman, Chicago, on September 1, 2 and 3, with the president, J. C. Beville (El Paso & Southwestern) in the chair. Following the opening exercises the technical work of the convention was taken up.

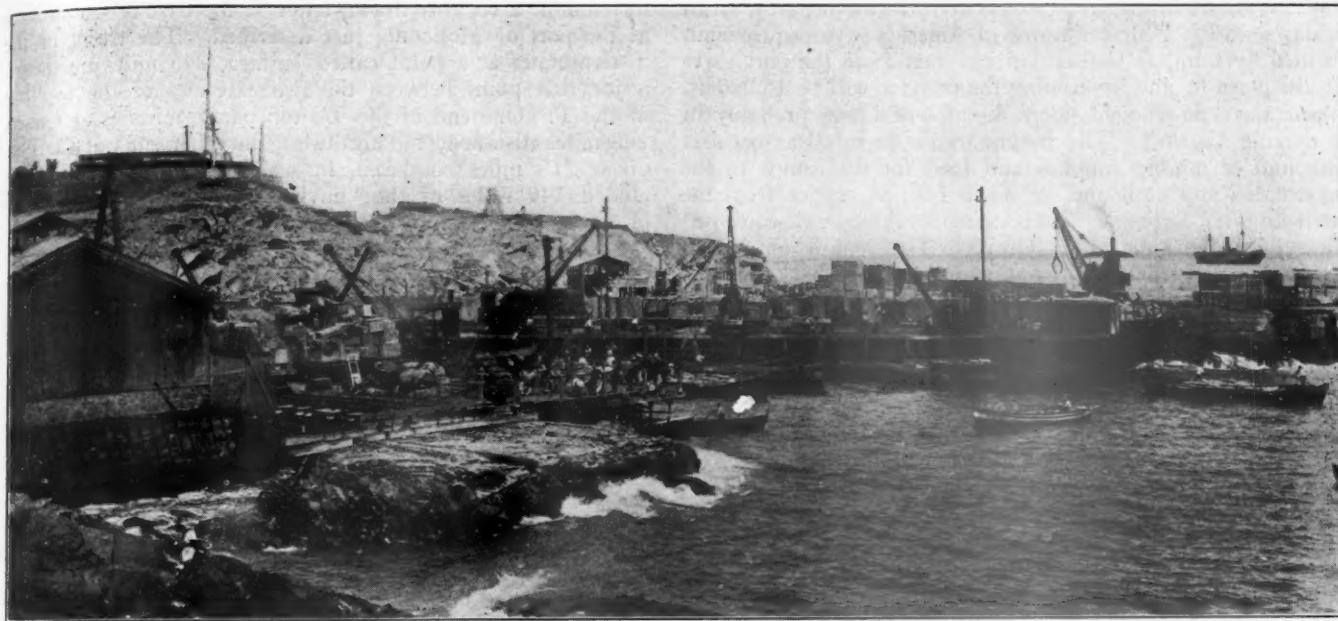
The committee on Standardization of Boiler and Stay-Bolt Taps, of which E. J. McKernan (Atchison, Topeka & Santa Fe) was chairman, recommended three types of staybolt taps; a button-head radial staybolt tap, two plug taps and a boiler stud and patch bolt tap. For the staybolt taps the committee recommended Whitworth thread, 12 to the inch, throughout. For the stud and plug tap United States standard threads, 12 per inch and $\frac{3}{4}$ -in. taper per foot were recommended. The standards recommended are all in use on many railroads and can all be obtained commercially.

The question of what type of thread would give the best service was the principal point discussed. The members indicated that comparatively few roads are using the Whitworth thread while about equal numbers are using the thread and the United States standard. Several of the members reported that tests had been run which indicated the pulling strength of the Whitmore is considerably greater than the others and the form of the thread on Whitworth taps will be much less affected by wear than that of the other makes. V-thread taps have been found to lose as much as $\frac{3}{1000}$ in. in diameter in cutting one hole under the heavy drive which they must withstand. Where a road makes its own taps, however, they can be made more easily in the United States standard thread than either the V-type or Whitworth. The committee recommended the United States standard type for plug and stay-bolt taps.

The report of the committee on Heat Treatment of Steels, of which C. A. Shaffer (Illinois Central) was chairman, emphasized the fact that to get the best heat-treated tools, proper equipment for heat treatment must be available, including suitably designed furnaces, pyrometers, quenching baths, tempering baths, etc. The report of the committee also discussed the structural changes which take place in steels as they are heated through a range extending above the transformation point, and drew attention to the great care which should be exercised in heating tool steel for forging. Proper equipment for the heat-treating room was described in detail.

The other subjects on which reports were presented were Jigs and Devices for Locomotives and Car Shops, Power Punches and Dies, and Issuing and Checking Tools in Locomotive and Car Shops.

The following officers were elected for the coming year: President, J. B. Hasty, Atchison, Topeka & Santa Fe; first vice-president, C. W. Smith, Chesapeake & Ohio; second vice-president, Charles Helm, Chicago, Milwaukee & St. Paul; third vice-president, Geo. Tothill, Buffalo, Rochester & Pittsburgh, and secretary-treasurer, R. D. Fletcher. The association voted to accept the invitation of the American Railroad Association, Section III., Mechanical, to affiliate with that organization.



View of Entrance to Lighter Canal, Port of Mollendo, Peru

The American Equipped British Railways of Peru

This Is the Third Article of the Series by Railway Age's South American Correspondent

By John P. Risque

IN A RAILWAY SENSE, the Republic of Peru presents a study in construction and operation not exceeded in interest to the American railroader by any other lines on the South American continent. In order to avoid repetition of details, the reader is referred to an article entitled "Peru's Railways Need Many Connecting Links," which appeared in the *Railway Age* of March 7, 1919, page 531. In this article there appeared a complete table containing the names of all the country's lines, their lengths, gages, commodities hauled and equipment owned. References to Peru's rugged topography, as well as a table of railway imports by countries of origin for the years 1913 to 1917, inclusive, will also be found in the article referred to. With particular reference to the table of railway imports, it is pertinent to draw attention to the fact that on the principal lines of Peru—principally all British-owned and operated—there exists a situation as to equipment which is not duplicated on any other British owned line in South America, if not in the world. American built locomotives and American type cars, both passenger and freight, predominate.

This, as I have pointed out in my two preceding articles, is very much of an exceptional case, but for fear that our own manufacturers of railway supplies may be misled as to the possibilities in Peru the comment is here made that the market on these lines is open to him, "if." This "if" is the same qualification that applies to all British-owned railways in South America and means briefly that if the British owners can procure their materials from England, frequently at a higher price than that asked by an American firm, England will get the order. If the material is not immediately procurable, the road will prefer to wait; so will England. This is the situation of 1920 as compared with ten years ago and later when these Peruvian lines were administered by a mechanical man whose preferences for

American equipment were sufficiently strong to overcome the objections of a London board of directors, who, since the war, in their determination to maintain Britain's world trade, have prescribed British goods wherever possible for their own projects all over the world.

Broadly speaking, the principal railways of Peru can, for purposes of easy description, be said to exist in three sections; mostly all of standard 4 ft. 8½ in. gage.

Lines in Northern Peru

The first section comprises the unrelated short lines from mines and plantations to the coast. The first one encountered below the Ecuadorian boundary is the line from Paita to Piura; the others are stretched along the coast at varied intervals all the way to Callao, the port for Lima.

An intending railway contractor would perhaps be rewarded by a trip from Paita to Callao; he would doubtless run across a possibility, perhaps several. A visit to Lima, however, the chief city and commercial center of the Peruvians, is suggested first. From there are administered the local lines in the north and there he will find the center of all the gossip relating to "estudios" and "proyectados" or railway construction studies and projects, respectively.

Central of Peru

The second section comprises the line from Callao, through Lima, and up to a point on the roof of the world called Huancayo. Known as the Central of Peru, a majority of the line constitutes what was once known as the Oroya Railway in the annals of the celebrated American Henry Meigs, who conceived the project and put it through. The road, including branches, is approximately 247 miles in length. Most of it may be described as "straight up." It runs from sea level to an elevation of over 15,000 ft. over a

line having 61 bridges, 65 tunnels and 21 switch-backs, all in a day's work. Four-car trains of American type equipment, hauled by familiar Consolidations, start from the port early in the morning and by evening the traveler will be 15,000 ft. above the semi-tropical sidewalk cafes of Lima, probably in a driving blizzard. The freight traffic on this line consists inbound of mining supplies and food for the camps in the mountains and outbound, or down hill, of copper from the well-known Cerro de Pasco mines, whose well-equipped line joins the Central at Oroyo. The length of freight trains is restricted by the lengths of the switch-backs on this the "highest railway in the world."

At a point on the way up, called San Bartolome, the line runs along a ledge which breaks off abruptly. A few hundred feet above it is another ledge, in order to reach which, in the limited space available, it is necessary for the locomotive to use a turn-table, placed upon an embankment built out upon the face of the cliff. Here the locomotive is turned so that it may continue the run in the opposite direction on the other end of the train. About 1,000 ft. higher up is encountered the Verrugas Bridge, 575 ft. long and set 300 ft. above the bottom of the ravine which it spans. Of the three piers supporting it, the central one measures 50 ft. square at its base. The bridge derived its name from a too well-known fever in these regions which is said to have cost hundreds of lives during the construction of the line.

The present administration of the Central has an American general manager whose headquarters are at the Desamparados station in Lima. Repair shops are maintained in a suburb and are worth a visit to those interested in a typical display of South American labor conditions in the maintenance of rolling stock. As yet, modern ideas on Bolshevism have not sufficiently crippled the output as to cause alarm, but sporadic outbreaks of discontentment are not unknown.

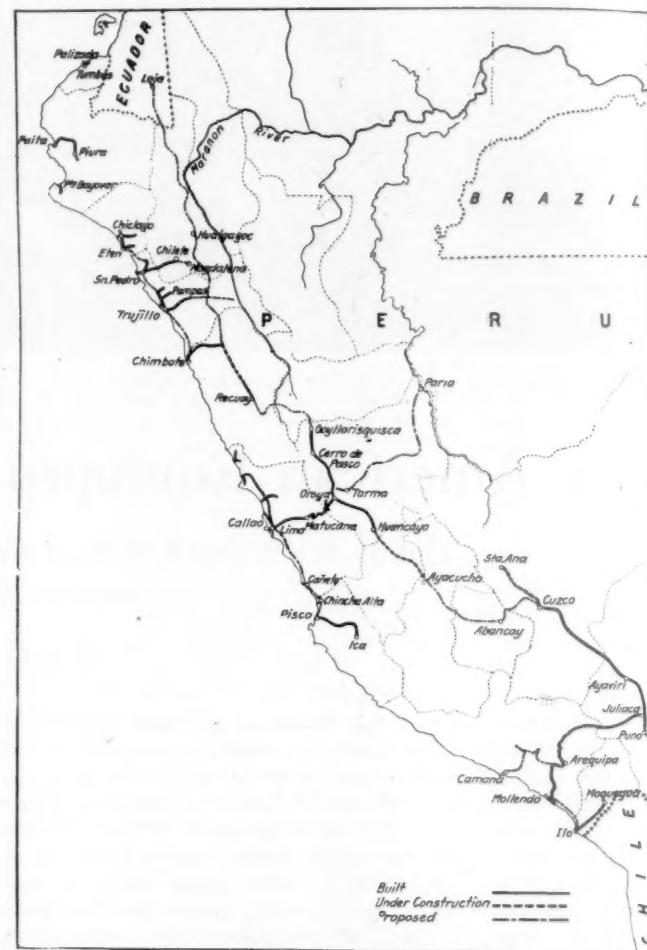
Southern of Peru

At a distance of 480 miles south of the port of Callao lies the port of Mollendo, second in importance on Peru's arid coast line and typical in all respects of the South American landing places on the west coast. Here is the base of the railway system located in the third section referred to, and known as the Southern Railway of Peru. In addition to its importance as a heavy importer of tonnage for the railways there, Mollendo is a permanent and never failing object lesson to the American shipper, who, if insufficiently convinced of the necessity for extreme care in packing for South American export trade, need only to go ashore and view the unidentified contents of what was once thought to be a crate capable of withstanding unlimited abuse of dumping merchandise from ships to lighters. Ships, as is usual in these ports devoid of a real harbor, anchor outside some distance from the shore. The lighters which tow the freight from the ships enter, wind and weather permitting, a 50-ft. channel, protected by a break-water on the shore. Along this protected canal are stretched tracks carrying steam cranes which lift the merchandise from the lighters to the cars alongside, or to the Southern's warehouses on the pier.

In following the description of the Southern, it is pertinent to relate at this point that this line's freight, mostly originating at Mollendo, is principally destined for La Paz, the capital and chief commercial center of Bolivia, about 535 miles further on and 12,500 ft. higher up. But the distance does not constitute all of the handicaps this line meets in competing with the Arica-La Paz, a Chilean government-owned line, 248 miles in length from the port of Arica, further down the coast in Chili, direct to La Paz. Besides the Southern's additional 287 miles of haul, the Southern has also two extra transhipments of freight to and from its Lake Titicaca division, as explained further on.

As its name implies, the system lies in Southern Peru. The plan of the line on a map of the country can be said

to resemble a roughly drawn letter T, the base of which rests at the port of Mollendo, just described. The trunk of the T terminates at a point called Juliaca, 296 miles northeast, a junction point between the two extremes of the top bar of the T. One end of the T's top bar terminates at Cuzco, 208 miles distant to the northwest, the other ends at La Paz, about 218 miles southeast, in which latter division is included 149 miles of the "navigating" division, the length of the run on Lake Titicaca.

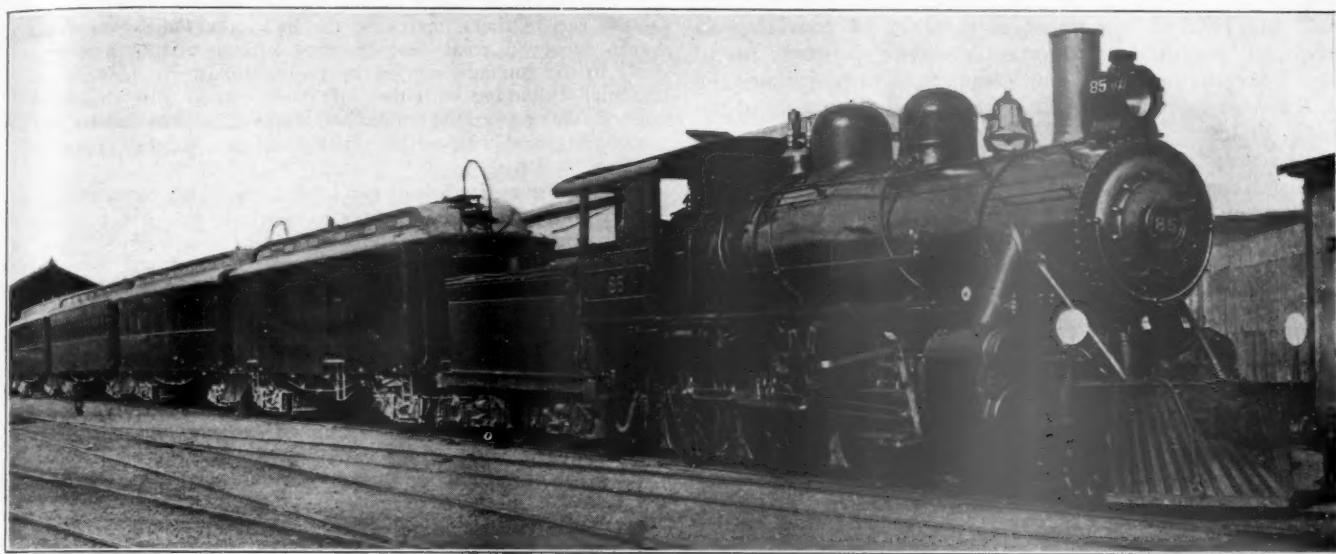


The Railways of Peru

The Southern's first operating division out of Mollendo skirts the barren seashore for about 13 miles, passes through a small but fertile valley called the Tambo, and then turns northeast into the foot-hills of the Andes. At this point begins the climb for Arequipa, 93 miles beyond and at an elevation of 7,500 ft. Here also begin the series of 421, 247 ft.-radius curves with which the line abounds; also the 4 per cent grades. Eighty-pound steel is laid on this division and aside from its three dollar California Redwood ties, there is little else to distinguish this part of the line from any other mountain railway. The second division is that from Arequipa to Juliaca; track conditions are good here, 60 lb. steel being used, but the hauling problem is not modified by any improvement in the severe Andean topography. At a point about half-way up the division, called Crucero Alto, meaning high crossing, the rise has registered an additional 7,000 ft.; the elevation of the line at this point being 14,666 ft. above sea level. From here, the line commences to drop 2,000 ft. until Juliaca is reached, the latter having about the same elevation as that of Lake Titicaca, 12,600 ft. The northwest arm or top bar of the T running from Juliaca to the ancient seat of the Empire of the Incas,

historic Cuzco, involves a climb of 2,000 ft. This division is being relaid with 75-lb. steel. The lower right-hand section of the T's top bar, running southeast and terminating in a twist, is called the Juliaca-La Paz division and is really as important a division as the two main line divisions

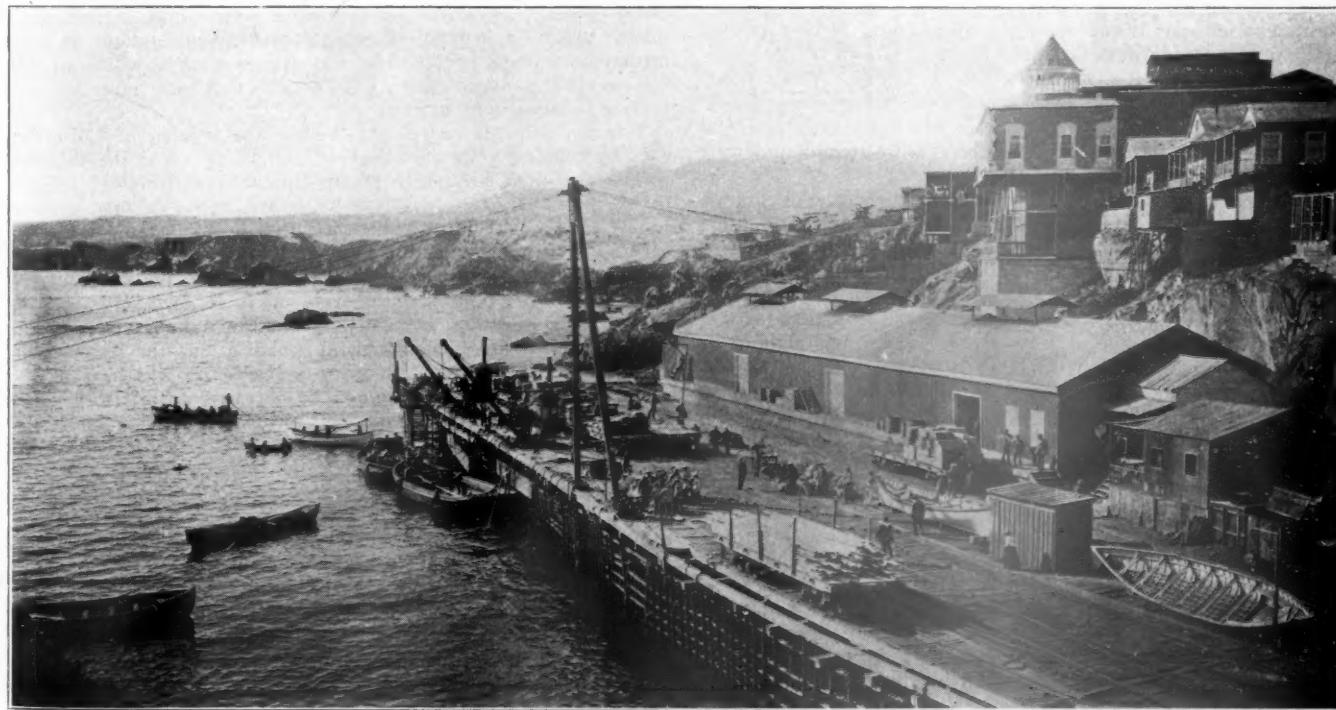
The meter gage division has four 2-6-0 type and two 2-8-0 type locomotives while the electric division operates with two 20-ton, 550-volt d.c. electric locomotives, four four-wheel trolley cars and four four-motor combination baggage and express cars. Power on the electric division



Built Complete at the Arequipa Shops, Southern Railways of Peru

between Mollendo and Juliaca, previously described. It is, to speak definitely, four divisions in one, viz., a short standard gage line from Juliaca to Puno on the northwest shore of Lake Titicaca, the lake division of 149 miles, a meter gage steam line 56 miles long to Alto, within 6 miles of La Paz, and from there to La Paz down a sheer 1,500 ft.

is derived from two Bolinder type Diesel engines each capable of developing 400 B. h.p. at sea level. These engines are direct-coupled to two 180-k.w., 550-volt, General Electric dynamos running at 165 r.p.m. There are also two 400-h.p. producer gas engines belted to two 150-k.w. generators for emergency use. A 1,160-ampere-hour Tudor



Entrance to Ship or Lighter Canal, Port of Mollendo

cliff on a meter gage electric line. The standard gage system employs 46 locomotives. Of these 10 are 4-8-0 passenger engines, 18 are Consolidations, and there are ten 4-8-0 types including some two-cylinder compounds, and the balance are switchers.

battery is run in parallel with the above plant and is charged and discharged by an automatic reversible booster. The transmission line is of ordinary 0000 grooved copper wire, supplemented by ample feeders tapped in at intervals of about a third of a mile.

Suggestions for Increasing the Freight Car Supply

WASHINGTON, D. C.

AN URGENT APPEAL to manufacturers and business men of the country to join in making better use of existing railroad equipment as a means of providing an immediate improved transportation service is made in an open letter to industrial and commercial organizations by the Railroad Committee of the Chamber of Commerce of the United States.

The committee points out that the equivalent of more than half a million cars can be added to the supply by closer co-operation on the part of all interests concerned with transportation. The letter points out that on September 1, under the provisions of the Transportation Act of 1920, the United States government withdrew its guarantee of a standard return; and "all the railroads of the country, privately owned and privately operated under a new regulatory law, with a new rate schedule and a new wage scale, will again undertake to furnish the public with adequate transportation service." The letter continues in part as follows:

To Shippers and Receivers of Freight Throughout the United States:—

Freight traffic has increased so rapidly in the United States during the past few years that it has completely outgrown the carrying capacity of the railroads. As a result it is now necessary for the roads to devise a practical plan for increasing their transportation service. There are only two ways in which they can do this:

1. By making extensive additions of new facilities and equipment, including freight cars, locomotives, yards, tracks and terminals.

2. By making greater use of existing facilities and equipment.

The railroads cannot carry out the plan first suggested because under present conditions they are unable to obtain a sufficient amount of new capital; nor would it be possible for them to provide new facilities in time to relieve the present emergency even if the capital were available. They must, therefore, rely on making a maximum use of existing facilities and equipment, with the co-operation of all the other interests concerned—the shippers of freight, receivers of freight and railroad employees.

You, as shippers and receivers of freight, can take a very important part in this movement. You can add 535,000 freight cars to the available car supply by loading your cars more heavily and loading and unloading them promptly. If the railroads were obliged to buy 535,000 new cars at the present price of about \$3,000 per car, it would cost them \$1,605,000,000 and would cost the public at least 6 per cent of that amount in the form of increased freight rates.

The average freight car spends its time as follows: 37 per cent of the time in the hands of the shipper or the receiver; 43 per cent moving from the point of loading or unloading to the terminal where it is put into a train or onto a transfer track; 11 per cent in a train moving from one terminal to another; and 9 per cent laid up for repairs. You, as shippers and receivers of freight, can effect a substantial reduction in the 37 per cent; and the railroads can effect an equally substantial reduction in the 43 per cent.

You can load and unload your cars promptly if you will. As a rule the railroads allow you 48 hours free time to load your cars and 48 hours to unload them before making any charge for demurrage. If you will use only one-half of this time, thus releasing your cars in one day instead of two, and in addition will order according to your loading capacity, restrict your car order to today's program, avoid the duplication of car orders, and avoid the use of cars for storage purposes, you should be able to reduce the time that the average freight car spends in your hands from 37 per cent to 22 per cent of its total time, and thus add 360,000 cars to the available car supply.

The average freight car makes 20 round trips each year. By

reducing the time needed for each trip 15 per cent you will enable the car to make 23 round trips each year. This is equivalent to adding 15 per cent of 2,400,000, or 360,000 cars to the available car supply.

The average capacity of the freight cars of the country is 41.6 tons. Some commodities, including coal, steel, ore, sand and gravel, can be loaded 10 per cent beyond the marked capacity of the car. Others, including the bulk commodities of various kinds, occupy a great deal of space without adding proportionately to the tonnage carried by the railroads. In loading commodities belonging to either of these classes you should disregard the prescribed minimum carload provisions for your commodity and, if possible, load your cars to their maximum capacity.

In 1919 the average load per loaded car of all commodities on all the railroads of the country as a whole was 27.8 tons—only 67 per cent of capacity. The railroads have now undertaken to attain an average of 30 tons per car. If you will co-operate with them and add an average of 2.2 tons to each carload, you will add nearly 8 per cent of 2,400,000 cars, or 175,000 cars to the available car supply.

The Association of Railway Executives, representing 95 per cent of the railroad mileage of the country, has unanimously adopted a program for speeding up car movement and increasing car efficiency in which they undertake, with the co-operation of the public, to secure for the country as a whole

1. An average daily minimum movement of freight cars of not less than 30 miles per day;
2. An average loading of 30 tons per car;
3. Reduction of car-order cars to maximum of 4 per cent of total owned;
4. An early and substantial reduction in the number of locomotives now unfit for service;
5. More effective efforts to bring about the return of cars to the owner roads.

You can help to reduce the present excessive number of bad-order cars. The last monthly report submitted by the carriers shows 7.4 per cent bad-order cars in the United States as against 5.7 per cent at the beginning of federal control, an increase of 50,000 cars unfit for use and actually out of service. It should ordinarily be possible to keep the number of bad-order cars below 4 per cent of the total number owned and, if that condition could be brought about today, it would result in immediately making effective on the railroads as a whole in the United States more than 75,000 cars that are now out of service because unfit to run.

You can help the railroads to reduce the number of bad-order cars by loading your cars carefully so as to avoid the injuries to the car that frequently result from the shifting of freight in transit.

The railway executives are aware that prompt action is necessary and they are making every effort to provide the public with adequate transportation service. Each individual road is working out its purely local problems in its own way; and all of the roads together are working out the national transportation problem through their central organization—the Association of Railway Executives. In order to carry on this part of its work effectively their association has created an advisory committee of chief executive officers, to deal with the Interstate Commerce Commission and to exercise general supervision over the handling of equipment and the movement of traffic.

The actual direction of car service on all of the railroads of the country during the present emergency is entrusted to the Commission on Car Service which has its headquarters in Washington, D. C., and is under the supervision of the Advisory Committee of the Association of Railway Executives. The Commission on Car Service is represented at each of the 35 congested railroad terminals by a Local Car Service Committee consisting of one representative of each of the railroads entering that particular terminal.

On May 24, 1920, the Commission on Car Service issued a circular suggesting a number of definite ways in which shippers and receivers of freight can help to improve present transportation conditions. A copy of the suggestions made by the commission is attached to this letter for your information. The Railroad Committee earnestly hopes that you will act on these suggestions.

The letter is signed by George A. Post, chairman of the Railroad Committee, and Richard Waterman, secretary.

The Ever-Present Bituminous Coal Problem

An Average of 1,946,937 Tons Must Be Produced for Each Working Day for the Rest of the Year

By Eugene McAuliffe
Union Colliery Company

THE RAILWAY AGE, issue of August 13, contains an abstract from an address delivered by the Editor, Samuel O. Dunn, before the Illinois and Wisconsin Retail Coal Dealers Association, at Milwaukee, on August 5, 1920. Mr. Dunn opened his address with the premise that the National Coal Association, the principal organization of the bituminous coal operators had unfairly complained, beginning in 1917, and continuing to the present time, that the railroads were responsible for the coal shortage suffered by the coal consumers of the United States and Canada. In attempting a friendly criticism of the opinions expressed by Mr. Dunn, I will try to divest myself of all partisanship, attempting to view this most serious problem in an impartial way. Certainly if the fuel problems of the country are to be solved something more constructive than trying to shift the responsibility must be attempted.

The National Coal Association is an organization which owes its origin to the vicissitudes that the industry suffered for many years. It came into being at a time when the tide of adversity in which the industry was submerged ran strongest. It was organized for protective purposes, let us say selfish purposes, just as was organized the Association of Railway Executives, representing the strong lines, and the affiliated minor association of executives, known as the American Short Line Railroad Association. I do not subscribe to all the National Coal Association does or says, and on the other hand railway executives frequently demur from the conclusions of their respective associations. Let us pass all associations as representing counsel for their respective interests, trying to get all they can.

That brings us back to the existing problem, and the real party at interest is the consumer, and while we are cracking heads, the consumer is squirming for enough coal of any grade and at any price to keep moving, this at the hour of minimum seasonal consumption. In 1917 we produced and transported 551,791,000 tons of bituminous coal, one-third of which contained five per cent excess and readily removable non-combustible impurities, the equivalent of 9,000,000 tons or 180,000 car loads of fifty tons carrying capacity, consisting of rock, slate, bone, and fire clay, which loaded down our freight trains, added to the congestion of terminals, and worse yet, when put into the fireboxes of locomotives caused failures innumerable; in fact, it was this situation which, piled on the back of an overloaded transportation machine, brought the threatened failure of the Allied Governments up to the threshold of the office of the director general of railways early in 1918. Out of the fuel situation experienced in the winter of 1917-18 came the urge for coal and coal transportation, which resulted in the production and movement of 579,386,000 tons of soft coal in 1918.

There is some plea for leniency to be made for what happened in 1917; we had never before seen a world at war. The human mind could not well compass the task of this nation alone, and in rising to the situation as we did in 1918 we made full amends for the previous year's deflections, but the curve of co-operation sagged in the spring of 1919 and *the primary offender insofar as the existing shortage of coal is concerned is the railroad*. Mr. Dunn well states that with the beginning of 1920 the country was short as a result of the coal strike of November 1, 1919, 45,000,000 tons of

coal. I will attempt to make clear wherein and how the railroads under government control were directly responsible for the 45,000,000 ton shortage and how the attitude taken by the Administration has been continued with perhaps some modifications under private management in a manner to make the recovery of the lost tonnage impossible.

Here let me refer to what was the real beginning of the coal famine that began to pinch the nation in August, 1919. In 1918, as before stated, we produced 579,386,000 tons of soft coal—this by far the greatest tonnage ever produced in twelve months. When the United States Railroad Administration organization was effected, the purchase of necessary equipment (including locomotives and cars), fuel, steel rails and ties, suddenly became a question of compelling importance. The path of the Division of Finance and Purchases, John Skelton Williams, director, proved to be other than a smooth one; its ambient way if we recall the protests of the locomotive and car builders, the supply men, the tie makers, and the steel men, was apparently not well lubricated. When the time for renewing railway fuel contracts came the same conflict that developed in the case of other necessities sprang to the front, and the conflict amiably fostered by the director of finance and purchases, and the Central Purchasing Committee was later espoused by the director general, until the situation reached the proportions of a direct issue between Director General McAdoo and United States Fuel Administrator Dr. H. A. Garfield; an issue eventually decided by the president who in substance found for the Fuel Administrator.

The question at issue then was, should or should not the Railroad Administration, one branch of the Government maintained by the tax payers, pay the same price for its fuel that the Fuel Administrator had fixed as a fair price for the coal operator to charge the general public, including national, state, municipal and civic bodies, the public utilities, the industries, and the house holders, paying for same in cash; or should the Railroad Administration, on the other hand, buy its fuel from certain preferential mines at a price paid partly in cash and in amount per ton below that fixed by the Fuel Administrator, the remainder of the purchase price to be paid in the form of a preferential car supply, that would for the contractor;

- (a) Insure better running time,
- (b) Produce correspondingly lower production costs,
- (c) Increase the daily and monthly output,
- (d) Attract mine labor from other mines,

all of which would cause the operator who was loading the seventy per cent of bituminous tonnage consumed by other than railroad consumers to;

- (f) Lose his employees to the railroad fuel mine,
- (g) Suffer a decrease in output,
- (h) Suffer an increase in unit costs,
- (i) Take a reduced profit and further shift a part of the expense of his increased cost of production on to the public in the form of lessened preparation methods, employing such labor as he could obtain, etc.

Dr. Garfield settled the matter by *securing the President's disapproval of the theory of buying railway fuel coal with part money and part cars*, reducing the government price of all bituminous coal sold to all the people ten cents per ton, this arrangement taking effect on May 25, 1918, a re-

verse from which the Railroad Administration never fully rallied.

I have referred to the conflict between the Railroad Administration and the supply men, the tie cutters, the equipment builders, and the United States Steel Company. A measure of compromise was displayed in disposing of the issues referred to other than that covering steel rails, which again went against the administration, but the conflict between the Railroad Administration as represented by the first dynasty and the coal men was perpetuated and accentuated by Mr. McAdoo's successor, who, generally capable of sound reasoning, seemed to have been so thoroughly inoculated with coal strife virus as to make him seemingly incapable of seeing the coal situation as a basic fundamental proposition woven into, and a part of our whole national, social and economic fabric.

This brings us to the real crux of the existing situation, as yet but a shortage, marked by wholesale libidinous exactions imposed on the consuming public, partly the outcome of increased costs due to the complete disarrangement of mine working forces, and resultant increased mine costs; partly to the insertion between the producer and the consumer of an element akin to that which springs up on all abnormal occasions, whether famine, fire, riot, or earthquake; and partly from the "get yours while the getting is good" spirit which seems to pervade the world at present. This fuel shortage occurring at a time when stocks of railway, industrial and domestic fuel coal are at the lowest they have been for years, presages trouble a few years hence when passenger trains begin to require steam heat, freight locomotive fuel consumption begins to climb, public buildings and houses call for fuel, and when the transportation machine slows down under the pressure of absenteeism seasonably exercised by experienced employees, cold weather, snow, ice, etc. In the summer of 1919 when the Central Purchasing Committee and the director general were midstream in their contract price controversy, the operators demanding the old fuel administration prices, and the director general expressing a desire to buy coal, with part money and part cars, the public somehow got the impression that the director general's opinion as to lower prices would prevail and it ceased buying, the railroads picking up the storage stocks left over from 1918, while 250,000 open top cars stood idle for lack of traffic and while mine workers became daily more and more restless under lack of employment, the men restricted, in the case of many mines to one or two days work per week. Later when mutterings of a coming mine labor storm became audible everybody asked for coal, and by July 15 the coal car surplus began to show signs of becoming a deficit, and in August a coal car shortage existed from Kansas to Roanoke.

During the low sales and production period the National Coal Association undertook to awaken the people with a "buy now" campaign appropriating \$100,000 for special advertising purposes. When 60 per cent of this fund was spent the campaign was called off largely as a result of the criticism directed at same by Railroad Administration representatives. *From the quarrel between the first director general and his staff continued by their successors and the coal operators over the purchase of Railroad Administration fuel, sprang the fuel famine that since has menaced not only the industrial fabric of the nation but which led to demagogic labor leaders, first, advancing their demands for the nationalization of the railroads and the coal mines; second, demanding a wage increase of 100 per cent coupled with a threat to cut off the production of coal until their demands were complied with.* These threats were, insofar as their abilities made them possible, put into effect on schedule, when 70 per cent of the bituminous coal production was cut off at four p. m., October 31, 1919. This cessation of the production of a vital basic necessity was coupled with a challenge directed by the union's president, not alone against the

nation's chief executive, but alike against the integrity of Congress and the United States Courts.

For the reasons outlined above and from the deep-seated feeling that no wrong will be righted until the real seat of the malady is discovered and the proper remedy applied, I have perhaps rather plainly outlined "the relation of the railroads to the coal problem." What is and where lies the remedy? The answer is just a little more coal. Twenty million additional tons produced and transported between January 1 and July 1 of this year would have carried the country out of the land of famine, exorbitant mine prices, predatory middle men, inferior quality and panicky buyers, into still water, requiring less than seven per cent additional coal tonnage effort. Mr. Dunn said in referring to the alleged estimated capacity of the bituminous coal mines of 18,000,000 tons per week or 936,000,000 tons annually, that "unless the railroads are to discriminate in favor of shippers of coal they cannot handle anywhere near all the coal mines can now produce without a very great enlargement of their facilities." I think the 936,000,000 tons annual production figure represents the sum of the coal operators mine ratings which are badly inflated, the actual potential production not exceeding 700,000,000 tons annually. I base my figures on the fact that under a favorable labor and car supply we produced and transported in October, 1919, the month preceding the strike, 56,243,000 tons, which rate if kept up would result in an annual production of 674,916,000 tons. October, however, is usually a good working month, devoid of extra holidays.

In connection with coal transportation, I think it might be well to here attempt the correction of a very common error, i. e., that the coal producer has claims on transportation. I hold he has one claim on the locomotives, cars and permanent way of the railroads, and *that is the right of equality of opportunity. It is the consumer who wants and has a right to demand transportation of coal and not the coal operator* and I wish to repeat what I said to the Interstate Commerce Commission on July 9 last that *when you read of a six, ten, or a twelve dollar price for coal (it has since gone higher) it is transportation that is being sold and not coal.* The public utilities and the general public are engaged in buying the use of coal cars (the coal itself has become an insignificant item). They are paying the tariff freight rate for the use of same and in addition they are paying to some one, or at times to several collectors, a sum frequently equalling four times the measure of the published freight rate, all to secure the use of a coal car and its collateral and attendant train service.

The railroads are continuously quoting comparative statements of coal loaded and moved, 1920 and 1919 compared; seldom does any comparison reach back even as far as 1918 and the comparisons of coal moved this year with last are futile and misleading if the task is to be properly measured. Until the great war came along to disturb conditions the bituminous coal demands of the nation doubled each decade; that meant an increase non-compounded of ten per cent each year. The country has and will continue to grow in wealth, population, and tonnage. If we were to project the increase in soft coal requirements of the country on the basis of but five per cent per annum, beginning with 1911 we would require an output of 588,565,227 tons in 1920. It is well if we are to keep on our course to make an occasional back sight and in this connection seldom is any comment made relative to certain conditions that are vital to the coal and coal transportation problem.

For example the best informed authorities warn us that the use of fuel oil for steam making purposes must be discontinued in the near future, and bituminous coal must be mined and transported to take its place. Again, the production of anthracite coal now at its zenith is destined to decrease and bituminous coal and its derivatives, coke, car-

bocoal, briquettes, etc., must take the place of anthracite. Further, when measuring up the equipment requirements of the carriers, it is a question as to whether we have fully estimated the extraordinary demand that now exists for open top cars for road material, structural steel movement, etc. In a flash we have been thrust into a new era, one of concrete and steel, all of which clamors for open top cars. Much useful information has been developed as to the coal stocks on hand, which are apparently lower than for years past; also as to the requirements of individual cities, districts and industries.

The fuel necessities of New England have been dwelt on by a committee of state governors, the necessities of the Northwest have played an important part in the councils of the Interstate Commerce Commission and the Committee of Railway Executives. The assigned car has barely kept the railroads in fuel with no margin to spare, priority orders are keeping the public utilities currently supplied at the present time, but they cannot use the arrangement to accumulate even a week's supply in storage. The big steel companies and others are scratching along with a few furnaces, dark at recurring intervals, while *pro bono publico*, including the small domestic consumer, is, so to speak, out on a limb. He frequently gets his meager ration from that nebulous portion of the mine production that perhaps should have been shipped on existing contracts, and from the emanations of the thousand small wagon mines that spring up to absorb labor and coal cars when the "picking is good," and what he does get he pays well for. As a matter of fact *nearly everything done up to this time has been of a fragmentary, cut and try, and only partially remedial character.* The man who said we are "trying to distribute our shortage" covered the situation in the fewest possible words.

What is the situation today, and what are our requirements? All else is aside the question. If the nation wants fuel it must have it even though other things must be put aside, and if the production of steel, automobiles, furniture, pianos, and the thousand other items that make up our transportation load are reduced, the coal requirements will be correspondingly reduced; the problem is one of striking a balance. For months coal has been on the low end of the teeter board. If we had had 20,000,000 tons additional production, February to June inclusive, this year, the average cost of coal on cars would be seventy-five cents per ton below the existing basis and the cost to the consumer would average perhaps \$2 per ton below what he is now paying. It was the deadlock between the Railroad Administration and the coal operators that precipitated the 100 per cent wage increase demand that led to the strike of November 1 last, and the failure to give the mines cars during the summer season now nearly at an end is responsible for the strikes occurring in July of this year, in the Central competitive field, which is being settled at this hour by another wage increase and a further permanent addition to the cost of production.

No one can accurately calculate the nation's coal needs; at the best we can only approximate them. In 1918 there was produced and transported 579,386,000 tons of soft coal. Of this approximately 30,000,000 tons was left over unconsumed, yet in spite of the industrial recession and the extremely mild winter that followed the armistice, we consumed and exported in that year 550,000,000 tons. In 1919 we produced and transported 458,063,000 tons. To arrive at the actual requirements of the year 1919 we must add the surplus 30,000,000 on hand January 1, 1919, and about 42,000,000 tons which should have been produced when the miners were on a strike extending from November 1 to December 12, and for lack of which production exports were cut off. Train service was reduced and our industrial output curtailed. Briefly we would, if it were available, have used 530,000,000 tons of soft coal in 1919. No man will

question the fact that our industrial and railroad fuel requirements for coal will during the current year fully equal that of the year 1919, which was above stated 530,000,000 tons. To this we should add 20,000,000 tons to create the small reserve stock absolutely needed to—

(a) Tranquillize mine labor, which has for months taken strategic advantage of the country's coal shortage.

(b) Remove the feeling of impending fuel famine which has hung over the people for more than a year.

(c) Eliminate the predatory speculator in coal, and otherwise reduce the cost to the consumer to a reasonable basis.

(d) To make possible that improvement in quality without which grave operating losses will be sustained by the carriers themselves during the coming winter.

We can dispense with the 20,000,000 tons of reserve stock. I am rather convinced that we will in fact do so this year, but our failure to produce and transport same will cost the people \$2.00 per ton on each ton produced until it is secured and moved to destination. This will mean something approaching \$400,000,000 for the period September 1 to December 31, a material portion of which will fall on the carrier through the item of price paid for confiscated coal and interference with operation.

If we agree on the estimate of 550,000,000 tons, and no one except a few who seek the glare of the spot light think it is excessive, then the matter can be reduced to a few words. The United States Geological Survey reports a production in the first seven months of the year of 302,739,000 tons, equivalent to 1,672,591 tons on each of the 181 working days, or 10,035,546 tons per week. To produce a total of 550,000,000 tons during the year suggests a car supply and production effort that will load and move 247,261,000 tons in the five months, August 1 to December 31, inclusive. This will require an average of 1,946,937 tons on each of the 127 working days that remain, allowing but one day off on Christmas, when the mine workers take from three to ten days. This represents a weekly production of 11,681,682 tons or a rate of production and transportation 16.4 per cent greater than was obtained in the first seven months of the year. If we decide to dispense with the 20,000,000 tons necessary to tranquillize the industry and safeguard the country (bearing in mind that this amount will disappear in less than ten days of rigorous winter weather) we can get along haltingly and hysterically as we have been doing with a production and movement of 1,787,095 tons on each of the 127 working days referred to, representing an increase of 6.8 per cent over the average production of the period January 1 to August 31.

This is the coal problem, as before stated, reduced to a few words. All discussion relating to Canadian requirements, exports to points over-seas, etc., is merely befogging the issue. We want our growing export trade. If England's trade mantle is about to fall on us why cast it aside? Britain's supremacy in the coal markets of the world is a thing of the past, and why deny coal exporters transportation when our statisticians tell us that our coal is steadily going but in the form of manufactured products? Take steel, for example; we are told that in the first five months of 1920 the exports of finished steel equaled 374,890 gross tons each month. As it takes four net tons of coal to make a gross ton of steel this represents about 7,500,000 tons of coal that went abroad in the form of steel in the five-months' period. Assuming that we keep up this stride, and I hope we will, we will send 18,000,000 tons of coal abroad, camouflaged as steel in the year 1920. In comparison with the 7,500,000 tons of coal that went abroad in the form of steel in the first five months, our actual overseas export tonnage totaled but 5,493,000 tons. If we sent coal abroad for a year at the speed attained during the week ending August 14 we would reach a total for twelve months of but 18,616,000 tons. Bear in mind this goes to Italy, the Netherlands, the

Scandinavian peninsula, Switzerland, the West Indies, five of our Latin American neighbors, as well as other countries. I have not referred to the 12,000,000 tons that annually goes to Canada. No one disputes the propriety of taking care of Canada, on the theory that, like "Mrs. O'Grady and the Colonel's lady," we are "sisters under the skin."

We are informed that the steel industry is operating at from 77 to 80 per cent of its capacity, with millions of tons of steel in storage. A steel mill can lose 20 per cent of running time at less relative loss than can a coal mine. There is not an industry on the face of the earth subject to the daily and seasonal uncertainty of operation that is suffered by the bituminous coal industry. *With the aid of their railway owners the anthracite producers have largely gotten away from a condition similar to that now and in the past experienced by the bituminous operator.* The apparent fixed attitude of many of our railway executives virtually disregarding this condition presages ill for the general public. We have fifty per cent of the world's coal reserve and now produce one-half of the world's coal supply. The railroads burn nearly thirty per cent of the bituminous coal now produced, and coal furnishes about one-third of the total tonnage carried by the railroads, likewise a material portion of the total freight revenue. The curve of railway revenue rises and falls with that covering the production of bituminous coal; a ton of coal moved to an industry shows a compound return in traffic earnings, witness the example of each four tons of coal furnishing a ton of steel, which in turn is frequently transformed into a further tonnage asset. I have discussed the coal labor situation with railway officials, who seem to think that serving a mine with cars 40 or 50 per cent of a possible 48-hour week represents service. If the same procedure was applied to their own train service, their repair shops and car repair yards, their railroads would go to pieces in a week; railway executives should be more than sympathetic with the work of equalizing the mine load factor. They should leave nothing undone, aye, even lead in the work of ironing out the peaks and valleys that beset the path of, not the coal operator, but the coal worker and coal consumer. With their rate problems now well behind them there is no field of opportunity so well deserving of study and effort, and I trust the *Railway Age* will point the way, as it has done many times in the past. In any case it is always pertinent to ask, "Why should the spirit of mortal be proud?"

Radio Telegraph and Telephone in Railroad Service

THE LOUISVILLE & NASHVILLE and the Nashville, Chattanooga & St. Louis are now carrying on exhaustive experiments in radio telegraph and telephone work under the direction of R. R. Hobbs, superintendent of telegraph. These experiments are not being made to test the practicability of radio service in general, as that fact has long since been demonstrated, but to determine its adaptability to the everyday necessities of railroad work. At present no tests are being made on train installations, but long and short wave apparatus is being tried out carefully and thoroughly in actual service and under varying weather, climatic and topographical conditions. The railroad is proceeding cautiously and while the tests have not yet been completed, developments so far have been highly satisfactory.

The Louisville & Nashville has two stations in the general office at Louisville, one located in the automatic telephone room on the twelfth floor and the other in the private office of the superintendent of telegraph on the ninth floor. These sets are of radically different types. The twelfth floor set is a deForest series honeycomb coil arrangement with audion

detector and two-step audion amplifier, for strictly long wave reception. This set is mounted in a carefully selected position where inductive disturbances are the maximum day and night; it is close to a main frame where 500 telephone and telegraph circuits center, many of the telephone circuits being arranged for phantom auxiliary and carrying, over the same pair of wires, telegraph duplex, printing-telegraph and composite, in other words all of the modern methods of wire utilization to the fullest extent.

In installing these sets, the railroad wanted to discount at once all of the inductive and static troubles it could expect on the line, and all known tests were tried out with more or less success; with the result that the set remains in the same location and is receiving signals clearly and distinctly from overseas stations with a minimum of interference. The apparatus in the office of the superintendent of telegraph consists of a short wave regenerative receiving set coupled to a three-step audion amplifier cabinet, equipped with audion detector and grid condenser.

The short wave cabinet has two variometers, a coupler, and secondary tuner. Switches are so arranged that the short wave section can be cut off and the audion amplifiers and detector transformed to long wave reception, throwing in through the tickler, a primary and secondary deForest honeycomb coil arrangement which coils are equipped with variable condensers for positive tuning. A sending set of small capacity is also attached for testing purposes only. On this set practically all of the ship and land stations overseas can be copied with ease.

The aerial question has been taken care of in several different ways. Early in the experiments the railroad learned that experts differed greatly as to antenna construction and that there were no set rules or specifications governing all conditions. The railroad built all types for experiment, with switches to throw them into sets. It now has six different aerials at Louisville, these being known in wireless technology as "inverted L," "T," "Fan," "Loop," "Single" and "V." They were not expensive and a total of less than two miles of copper wire was used. They are all good but of different wave lengths and efficiency; some develop more static than others, but the signals ride in over and above this disturbance.

After several months' experiment it was decided to install additional stations at Tullahoma, Tenn., and Guntersville, Ala., on the N. C. & St. L., during September, between which points (70 miles apart on an air line) it has been impracticable to establish land telephone or telegraph service. The equipment at these points will be of the short wave regenerative type with sending energy of 1 k. w. These stations will be followed by others, and it is expected that in the near future all division headquarters on the two railroads will be linked to the general offices by radio, as an auxiliary to the land lines.

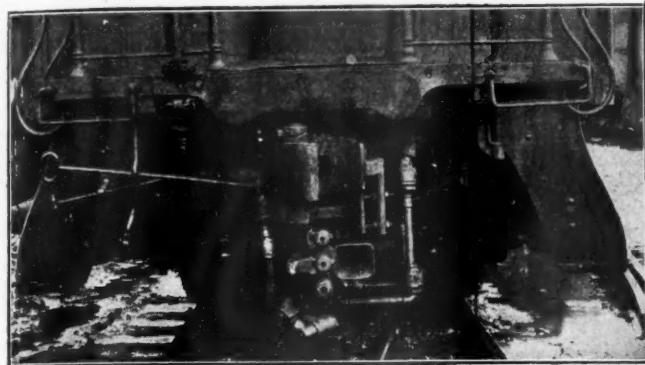
The Louisville & Nashville is particularly anxious to establish radio service between Louisville, Mobile and New Orleans because of the severe storms that occur along the gulf coast every few years, when it is almost impossible to maintain wire service. It appears from the present experiments that it will be entirely practicable to do so, as signals are now being received very clearly and distinctly from radio stations at the points mentioned.

SUCCESSFUL REGULATION, manifestly, must be elastic enough to enable the roads to earn living wages. That does not mean a constantly changing scale of rates, but it does mean that regulation shall not sentence those properties to long terms of penury. The railroad competently managed should not have to eat, sleep and drink with the specter of insolvency; it should enjoy the prosperity which capacity commands in strictly private industry. —*St. Louis Post-Dispatch.*

The Beahm Automatic Connector for Train Pipes

Principal Features Are Pin and Funnel Alining Device and Method of Coupling to Air and Steam Hose

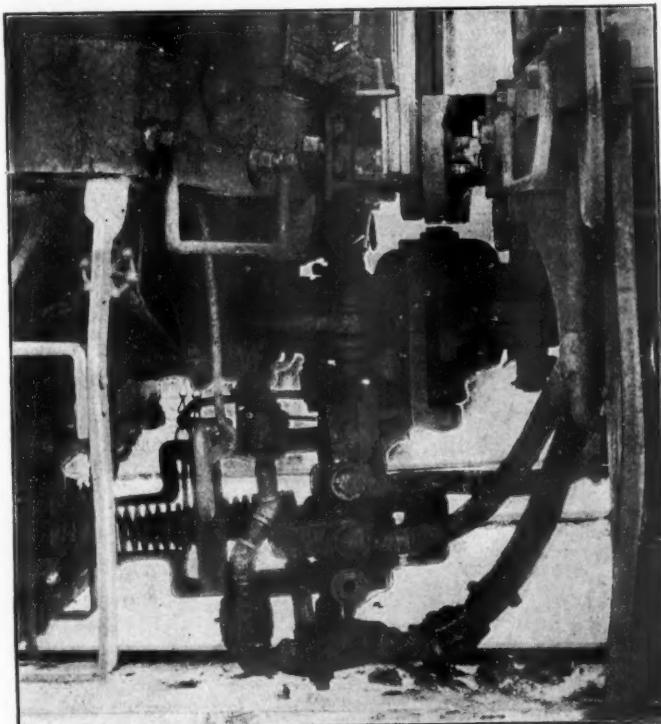
AN AUTOMATIC connector for train pipes, which embodies several interesting features, including a unique method of interchange with cars having standard steam and air hose, has been developed by Peter Beahm, Altoona, Pa., and was applied for test purposes under the direction of the Railroad Administration. The connector differs from other



End View of a Car Equipped with the Connector

types in the gathering arrangement, in the method of attachment to the coupler and in the means employed for coupling to cars not equipped with connectors.

The connectors on adjacent cars are alined by means of

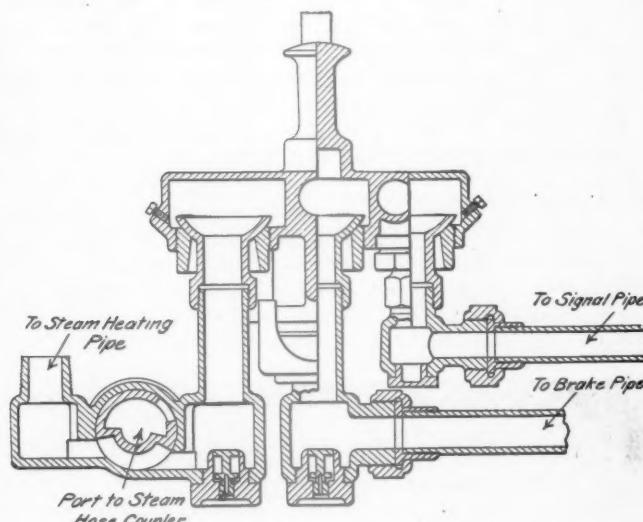


Position of Parts When Coupled to a Car Having Standard Hose Connections

a pin on the horizontal center line of the connector and some distance to one side, and a funnel on the opposite side having a rectangular opening leading to a central cylindrical opening. The funnels guide the pins so that the cylindrical end of the

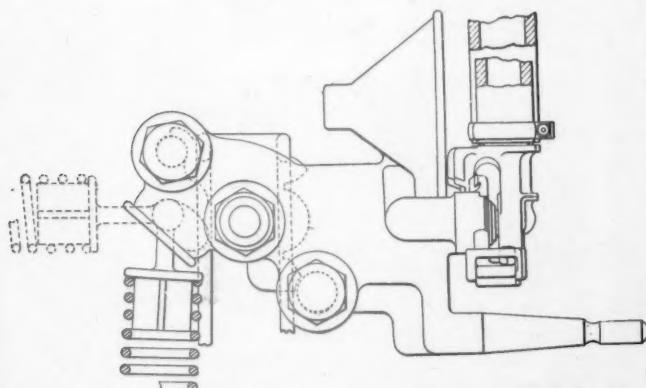
pin will enter the bore of the funnel. The ports in the connector are so located that they come into contact just before the couplers close and are held to their seats by the compression of coiled springs.

The bracket supporting the connector spans the head of



Details of Connections to Coupler Carriage

the coupler and is held in place by a long knuckle pin. The bracket is so arranged that in case the pin breaks it is still held in position and the connector cannot fall to the track. The supporting bracket also carries an arm, on the end of which is a shoe, the shoe being clamped against the guard arm of the coupler by a set screw. The rear portion of the



Plan of Connector Carriage, Showing Method of Attaching Air Hose and Two Positions of Spring

frame consists of a bracket provided with two vertical slotted plates. This bracket supports the main connector frame, which is provided with slotted projections having teeth to engage the bracket of the main frame. Thus the height of the connector can be adjusted independently of the coupler.

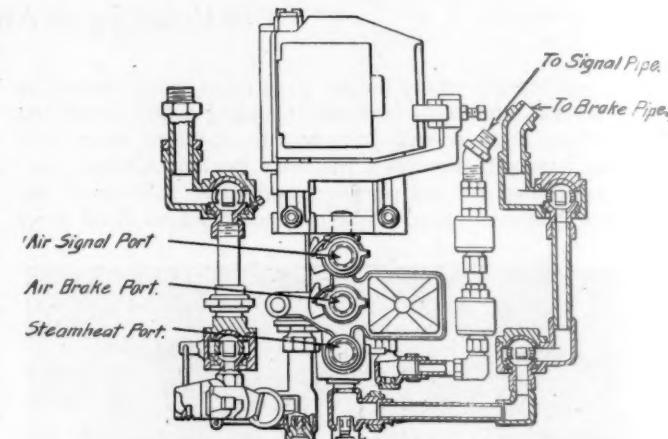
The main connector frame has two parallel horizontal members which terminate in a yoke having a boss at the center to receive the rear end of a coiled spring. The vertical guiding stem carrying the connector head fits in a slot in the upper portion of the frame and the carriage for the

connector, which contains the gathering device and the ports, slides upon the lower frame member. On the rear face of the carriage is a socket into which fits a knob carried in the outer end of the coiled spring, which extends to the rear of the yoke. The spring holds the carriage at the forward end of the yoke, where its travel is stopped by the stem engaging the outer end of the slots. The socket and boss are offset slightly from the center line of the carriage and the form of the slot is such that pressure of the spring will hold the connector ports either on the center line of the car coupler or at a position approximately at right angles to the center line. The carriage is provided with three channels, the center one terminating in the air brake supply port, the others leading to the upper air signal port and the lower steam heat port, all three being in the same vertical plane. On the ends of the carriage opposite the air brake and signal ports are lips provided with recesses for receiving the lugs of the standard air and signal hose couplings.

The channel for the air brake connection leads to the rear of the carriage, where it enters a vertical passage, which is closed at the upper end by a plug, while the lower end carries the condensation valve. This port is also connected by horizontal and vertical ball jointed pipes to the air brake line. The air signal pipe connections are similar to the air brake connections, except that no condensation valve is provided.

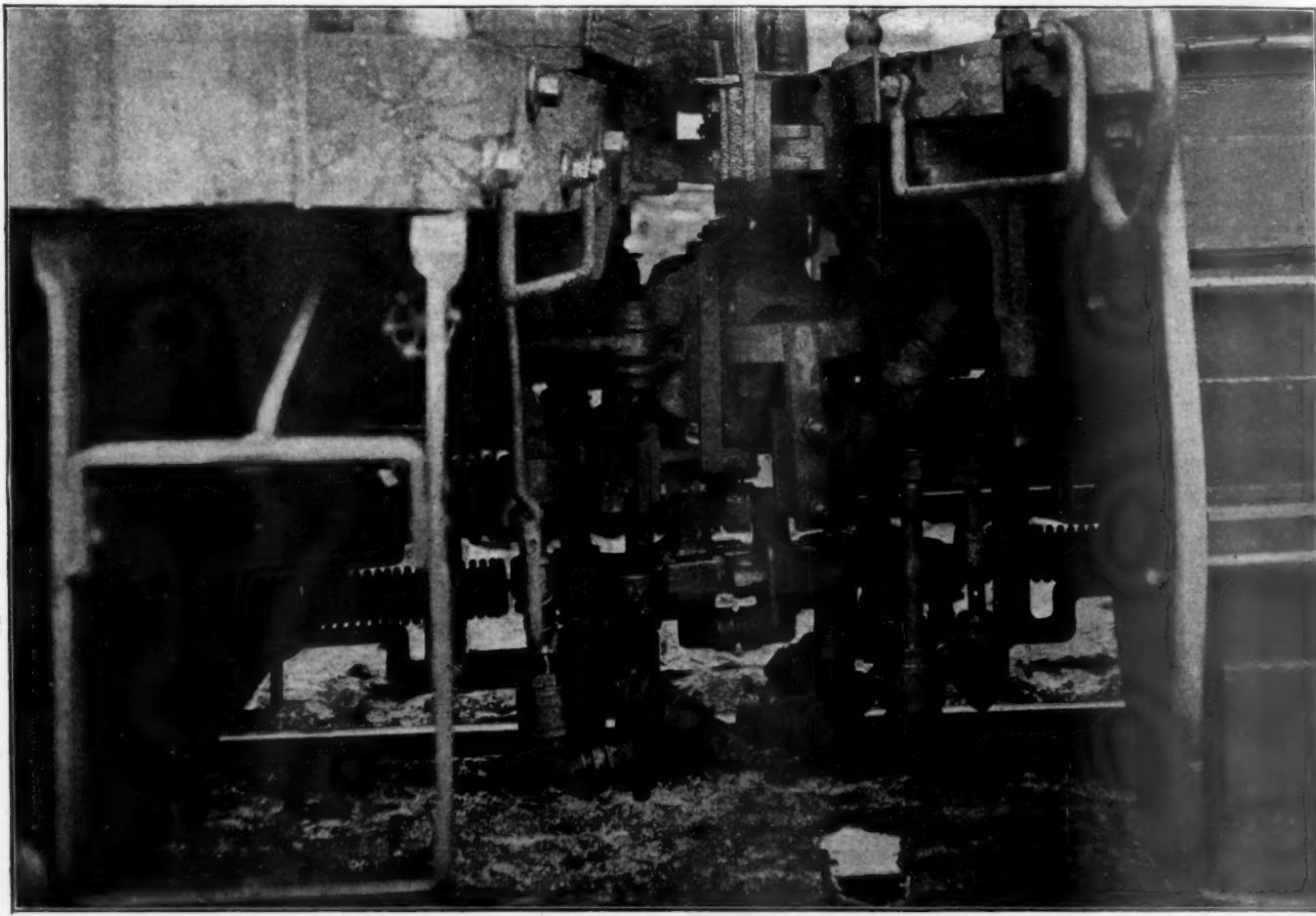
The steam heat connection is carried on the opposite side from the signal connection. A vertical pipe from the car-

a standard steam heat coupling, which is connected to a port in the key. When the cock is in the normal position and the carriage is in line to couple with connector-equipped cars, the steam passes through the cut-away portion of the



End Elevation of Coupler Showing Piping Arrangement

cock directly to the port. In this position no steam can pass out of the steam hose coupling. When the connector is used with the ordinary form of coupler the coupling and the cock



Cars Equipped with Beahm Connector Coupled Together

riage leads to the condensation outlet valve and a casing having a hole for the reception of a plug cock and an outlet through the cock, which is connected to the steam heat line by flexible jointed pipes similar to the air brake and signal connections. The plug cock in the steam inlet casing carries

are turned through a half circle, when the port assumes a position that prevents the steam escaping to the port in the face of the carriage and opens a passage from the steam line through the steam hose coupling. The carriage can then be turned at right angles to the coupler center line, thus allow-

ing the air brake and signal hose to be connected to the respective ports.

A special feature of the connector ports is the metal coupling ring which is provided with several concentric grooves. In case dirt lodges upon the smooth portion of the ring the action of the opposing connector will cause it to be rubbed into the grooves, thereby eliminating leakage.

The connector, as will be noted, provides a complete metallic connection throughout the train. The joints in the carriage and the pipes are formed by removable seats into which are seated hemispherical joints having a limited angular movement. These joints have no packing and are kept tight by the weight of the attached parts and the pressure acting upon them. This form of joint is an earlier invention of the originator of the coupler.

Executives Meet at Chicago

THE ASSOCIATION of Railway Executives, meeting at the Hotel Blackstone, Chicago, on September 3, took action on a number of matters which are expected in their various aspects to be of far reaching importance.

On the recommendation of the advisory committee, of which Daniel Willard, president of the Baltimore & Ohio, its chairman, it was voted to submit through the American Railway Association an increase in the per diem rate to \$1.10 from the present rate of 90 cents.

It was voted to establish also an emergency rate of five cents per mile to be paid, under certain conditions noted in more detail below, for excessive empty freight car mileage, which may have been required by orders of the Commission on Car Service or of the Interstate Commerce Commission.

Because of confusion sometimes arising from the use of the word commission in the name Commission on Car Service, it was decided to effect a change in the name of that body whereby it will be henceforth known as the Car Service Division of the American Railway Association.

The uniform contract between the railroads and the American Railway Express Company was considered and after certain revisions was approved.

The meeting also voted to establish a committee to consider the question of statistics, their proper compilation, their publication and use and in general to work out ideas as to the manner in which such data might be most effectively used.

The question of the division of through rates with the short lines was considered and steps were taken to call for the holding of conferences by the proper traffic officers in an attempt to readjust the matter satisfactorily.

The announcement was made of the resignation from the standing committee of William Church Osborn, general counsel of the El Paso & Southwestern, and the election in his place of T. M. Schumacher, president of that road.

Considerable attention was given to the question of national boards of labor adjustment. It is understood that the Association decided to consult with the United States Railway Labor Board relative to this matter, but no official announcement has been made pending the transmission of necessary letters to this board and to others.

The resolution adopted as to compensation for excess movement of cars to which reference is made above is as follows:

Compensation for Excess Empty Movement of Cars

Whereas, The Association of Railway Executives recognizes that the orders of the Commission on Car Service and the service orders of the Interstate Commerce Commission, relocating equipment, have been necessary in the interest of better transportation efficiency, and that from time to time additional orders of the same character will probably be required for the same purpose, and

Whereas, It is of primary importance that freight cars be relocated on the home roads as promptly as possible, and

Whereas, The Association of Railway Executives recognizes that, to accomplish these objects systematically and efficiently, the relocation of cars must be supervised by some central authoritative body and that such relocation of equipment cannot be made effective unless the directions of the central authority, as now vested in the Commission on Car Service, receive full and hearty support and prompt obedience, and

Whereas, In relocating equipment, notwithstanding the Commission on Car Service has been directed to use every endeavor to balance empty mileage by an equal amount of loaded mileage, it is recognized that some excess empty car movements will be inevitable, and that such relocation of equipment being now in the general interest, it is, therefore,

Resolved, That the following regulations be adopted, effective September 1, 1920, to govern compensation for excess empty movement of cars created by the relocation of freight equipment in compliance with orders from the Commission on Car Service, and service orders of the Interstate Commerce Commission.

1. A railroad which is directed to handle empty cars by orders of either the Commission on Car Service or the Interstate Commerce Commission, which for just reasons it claims it ought not to have been required to handle, and by so doing produces within the six months period, September to February, inclusive, or March to August, inclusive, excessive empty freight car mileage on any of its divisions, such railroad may be reimbursed for the excess mileage thus produced at the rate of five cents per car mile, which is intended during the present conditions as an emergency rate and as a reciprocal charge for the service, provided, however, that no payments will be made where the movement exacted of a line, simply fulfills its interchange obligations, subsequent to September 1, 1920, or where it is in accordance with car service rules.

2. Any railroad performing such service may present claim for reimbursement, supported by necessary data, to the Commission on Car Service. Should the commission decide the claim to be warranted it will authorize payment for the same through the American Railroad Association; the amount of such claim to be assumed by the railroads, members of the American Railroad Association, on the basis of loaded freight car mileage made within such period. Due consideration shall be given to the principle of equalization of car movement between carriers and of restoring to the owning roads the substantial equivalent of their ownership.

3. The principle enunciated to apply in connection with carrier railroads handling excessive empty freight car mileage shall also apply to switching or belt railroads and any expense on the part of switching or belt railroads incident to the handling of such excess empty mileage shall be adjusted by the railroads interested within the switching territory under direction of the Commission on Car Service.

4. A railroad whose claim for reimbursement may be declined by the Commission on Car Service shall have the right to appeal the decision of the Commission on Car Service to the Advisory Committee of the Ass'n. of Railway Executives.

5. Records to be maintained by the Commission on Car Service to enable it to avoid, as far as practicable, excessive empty car movements on any railroad.

THE EXPERIENCE OF THE NATION with public operation as aggravated by war finance has been little short of disastrous. Not the least dangerous element in it has been the failure to enlarge equipment and to provide adequate means of transportation. The restoration of the lines to their owners has come in the nick of time if it results in arresting the drift toward inefficiency and toward hopelessly high costs. Whether the private managers who now resume both the responsibility for and the control over the roads can under the new conditions to which they are exposed reintroduce the older ideals of efficiency remains to be seen. It will be essential to labor steadily and with the utmost courage if we are to work out of the present position and at the same time to obtain the capital needed for the development of the lines.—*N. Y. Journal of Commerce.*

Acme, Schenectady, Bertha

NEAR ACME, ILL., on the Peoria & Pekin Union, on July 3, there was a butting collision of passenger trains, which is like that at South Chicago, noticed in the *Railway Age* of September 3, in that six or more persons were held negligent in connection with its cause. In both cases the disregard of the usual and well-known rules which are prescribed for the operation of trains at speed was so flagrant that one who reads the account of the circumstances is forced, almost, to the conclusion that the men involved must have been laboring under the assumption that the train movements were all being made under yard conditions—under rules requiring every engineman to keep his speed constantly under control and to be prepared at any moment to stop within the range of his vision. Only on that supposition it is easy to believe that trainmen of experience, on busy railroads, having fair records, would conduct, or allow, the movement of passenger trains in such utter obliviousness to well-settled and well-understood rules.

The trains in collision were northbound passenger No. 206 and southbound passenger No. 209, the latter being No. 5 of the Toledo, Peoria & Western. No. 206 was superior by direction. Both trains had reduced speed to about five miles an hour. One employee was killed and 15 passengers and one employee were injured. Train 209 had just passed from double to single track with everybody apparently oblivious to the existence of train No. 206, although both trains were at or nearly on schedule time. The switch was turned by some outsider, not known to the trainmen; and the brakeman, evidently with no sense of responsibility, gave a proceed signal as soon as he saw the switch turned. On this signal, the engineman proceeded. The conductor, absorbed in taking tickets, had left everything to the brakeman. The brakeman took no interest in the time-table rule of superiority, or in train orders, except to assume that the engineman had received orders against No. 206. The engineman, according to the report of the government investigator, "took it for granted" that 206 had arrived. This engineman had no time table and did not know the schedule of 206. The brakeman turned the switch back after the train had passed over it, but the conductor is censured for not knowing whether this was done or not. Clearance cards are provided for, in connection with train orders, but without adequate detailed rules. An operator delivered an order which had been annulled—which error, however, did no harm—but failed to record the time of the repetition of an order; issued an order with no date written upon it, and was in the habit of signing conductors' names to "31" orders without authority. The conductor of 206 failed to register at Hollis Junction.

Following a 1,200-word summary of this kind of evidence, the government investigator concludes: "This accident resulted directly from the failure of all four members of a train crew to perform their duties; any of them, by the exercise of the ordinary precautions expected and required of experienced men engaged in train service, could have prevented this accident. The investigation disclosed inadequate operating rules, extremely lax methods and practices, and habitual disregard of existing rules; these conditions rendered this accident possible, and require immediate correction by responsible operating officers."

Schenectady, June 9

The Schenectady collision, which killed 15 persons, was reported in the *Railway Age* of June 11, page 1689. The I. C. C. report, dated July 20, gives some additional facts. The engineman (who was killed) was experienced and thoroughly acquainted with the road, and had not complained of ill health. The automatic block signals are about one mile apart and the fireman gave testimony as to the engine-

man's calling to him as signals were passed; but the fireman was at work on his fire and his testimony is uncertain, and practically worthless. His usefulness as a monitor was nil. There was testimony that torpedoes had been placed by the brakeman of the standing train, but numbers of persons in the vicinity did not hear any explosions, and the brakeman himself gave no useful information. It appears certain, however, that train 34 was only about four minutes behind train 28 (at a station five miles back) and both were fast. The brakeman is not censured for not going back far enough.

Train 28 had been stopped by a leak in the brake pipe under the tender, caused by a defective nipple. The nipple had been rethreaded at Utica, 75 miles back, and the leak was apparently cured; but the master mechanic, viewing the nipple after the collision, said that it was not fit for use. Careful inspection disclosed no fault in the automatic block signals. The distant signal had given a false clear indication in November, 1918, when an insulation in the track relay had been broken down by lightning; and the home signal had stuck in the stop position in August of that year. These were the only faulty operations of these signals in 12 years. A coach in train 34 had a brake cylinder with too much piston travel, making its brakes useless, but otherwise the brakes were all right.

There is no question that the engineman was awake when a short distance from the standing train, but why he disregarded the signals and the red lantern and the fusee of the flagman is a question left unsolved.

Bertha, May 9

The collision at Bertha, was briefly reported in the *Railway Age* of May 14, page 1425. On a suburban line, a few miles from Portland, Oregon, on the Southern Pacific, two electric passenger trains met on a ten-degree curve where each engineman had only about 500 feet in which to see the opposing train. The eastbound train, No. 124, had run past its meeting point about a half mile and was moving, on a descending grade, about 35 or 40 miles an hour, though the rule limited speed at that point to 20 miles an hour. One steel car was crushed for 19 feet. Six passengers and three employees were killed and 91 passengers and 10 employees were injured.

The I. C. C. report, dated July 9, gives interesting details. Conductor Pharis (16 years' service), and Engineman Willett, (eighteen years) of No. 124, left Bertha after both had recognized it as a meeting point (the conductor by pulling the signal cord and the engineman by sounding the whistle in response). The engineman had talked with the conductor and with a brother engineman and had appeared in normal condition, though he had spoken of not feeling well the previous night. The motor car had "dead man's control," but the evidence is conflicting as to whether the brakes were applied before the trains came together.

The report refers to previous collisions on the same road in the same vicinity, one in 1915, and one in 1918, and says that the density of local passenger traffic between Portland and Reedville, 16 miles, calls for the adoption of an adequate block signal system; such a system should be "promptly placed in operation on this line."

FOR MORE TRANSPORTATION.—The shipper who has been used to employing railway cars as storage space for his own convenience should readily comply with the request that he forego the practice for the sake of better transportation. Some temporary inconvenience can be tolerated in this respect, and in the long run it will prove profitable. The increase in freight rates cannot work magic in restoring railway efficiency of itself. Nationwide support should be given this movement to obtain maximum service from existing transportation facilities.—*New York Sun*.

Freight Traffic Still Showing Increased Movement

Reports Continue to Reflect Marked Improvement in Almost Every Section of the Country.

THE EXTENT to which the railroads are regaining their efficiency, as the congestion and other effects of the labor troubles which were most acute in April are being overcome, and also the extent of the volume of traffic that is being offered them for movement, is indicated in the increases being shown in the statistics of revenue freight car loading compiled by the Commission on Car Service. For the three weeks of August for which the reports are now available, ending August 21, the railroads handled a greater volume of freight traffic than ever before in the corresponding weeks of the year, a total of 2,878,758 cars, as compared with 2,628,714 in the corresponding three weeks of 1919, and 2,868,373 for 1918.

For the week ending August 21 the total number of revenue cars loaded was 964,256, as compared with 913,209 in 1919 and 971,622 in 1918. This represents a gain of about 2,000 cars over the previous week, and while the total for the week was slightly less than for the corresponding week of 1918, the total for three weeks is 385 greater than for the three weeks of 1918, and 240,000 greater than for last year. As the volume of freight handled in August, 1918, was greater than in August, 1917, the figures indicate that the roads have been breaking the record of the two war years for the corresponding periods, although August is not the heaviest month in the year and this year's traffic has not yet reached the volume attained in July, 1918. The reports have been showing consistent gains in car loading for the past three or four months, but particularly during the last four weeks for which the reports are available. For July 31 the total was 914,000 and for the three weeks of August it has been 942,000, 962,000 and 964,000, as compared with 947,000, 948,000 and 971,000 in 1918. The report for the week ending August 21 is as follows:

WASHINGTON, D. C.
show an increase for the week ending August 21 to 137,200 for the United States and 142,320 for the United States and Canada, of which 46,536 were coal cars and 74,777 were box cars.

Reports received by the Commission on Car Service indicate some progress made during the month of July in increasing the average daily movement of freight cars in accordance with the resolutions adopted by the railway executives, establishing an average of 30 miles per car per day as a standard to work to. For July the average miles per car per day was 25.7, as compared with 21.3 in July, 1919, and as compared with 25.1 for the month of June, 1920. The 1920 figure, however, is an average of averages and, therefore, not claimed as entirely accurate, as the weighted average has not yet been worked out.

The weekly reports of the local committees on car service continue to reflect a marked improvement in transportation conditions in almost every section of the country, although in general the supply of equipment is not sufficient to meet all the requirements. Most of the terminals covered by the reports are free of congestion and many committees report freedom from embargoes and normal switching service. Several of the committees in their reports for the week ending August 28 commented on the improvement in labor conditions. Practically all the committees are continuing their campaign to induce shippers and consignees to release equipment promptly and to load cars to capacity.

The Detroit committee reports that all lines in the terminal are working on a normal basis. The National Automobile Chamber of Commerce, the Detroit Board of Commerce, the Detroit Coal Exchange and other organizations are co-operating in bringing about more prompt release of cars and heavy loading. The Denver committee reports that 91 per

REVENUE FREIGHT LOADED AND RECEIVED FROM CONNECTIONS.

Summary—All Districts; Comparison of Totals This Year, Last Year, Two Years Ago. For Week Ended Saturday, August 21, 1920.

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L. C. L	Miscellaneous	Total revenue freight loaded			Received from connections				
										This year, 1920	Corresponding year, 1919	Corresponding year, 1918	This year, 1920	Corresponding year, 1919	Corresponding year, 1918		
Eastern	1920	7,385	2,520	53,867	3,283	8,839	11,123	46,053	94,591	227,661	...	...	257,598	237,860	259,004	
	1919	8,899	2,854	52,716	3,198	8,839	3,759	17,788	130,046	228,099	237,234	138,936	...	142,890	191,385		
Allegheny	1920	2,702	3,282	65,061	6,604	3,859	13,605	38,808	71,856	205,777	...	204,713	220,481	...	...
	1919	4,426	3,280	62,478	5,181	4,135	9,282	42,166	73,765	...	204,713	220,481	19,631	142,890	191,385		
Pocahontas	1920	191	226	22,073	744	1,876	271	2,971	6,844	35,196	...	36,862	40,430	18,142	21,094		
	1919	419	363	23,782	620	1,922	240	128	9,388	...	...	...	...	...	...
Southern	1920	3,335	2,152	24,215	1,715	21,242	2,942	34,708	47,630	137,939	...	126,997	124,175	75,149	69,578	66,673	
	1919	3,653	2,250	21,606	437	22,344	2,451	17,969	56,287	...	126,997	124,175	57,644	61,824	77,412		
Northwestern	1920	11,524	6,718	12,965	1,620	17,964	45,206	28,207	39,614	163,818	...	123,939	166,019	71,348	72,761	67,908	
	1919	12,650	8,567	6,757	1,020	15,834	11,888	20,688	46,535	...	123,939	166,019	50,849	50,849	47,670	45,409	
Central Western	1920	11,200	9,938	20,191	767	6,249	3,119	31,295	46,423	129,182	...	131,320	125,111	71,348	72,761	67,908	
	1919	14,852	11,757	19,606	828	5,924	3,619	24,162	50,572	...	131,320	125,111	61,824	77,412	72,761	67,908	
Southwestern	1920	3,952	2,490	5,908	238	8,744	322	16,820	26,209	64,683	...	61,279	58,172	47,670	45,409	47,670	45,409
	1919	7,037	2,902	6,879	202	7,584	382	12,512	23,781	...	...	...	...	...	...	...
Total all roads	1920	40,289	27,326	204,280	14,971	68,773	76,588	198,862	333,167	964,256	...	...	671,155	...	...	...
	1919	51,936	31,973	193,824	11,486	66,582	31,621	135,413	390,374	913,209	...	...	620,725	...	...	728,885
	1918	...	...	...	...	...	...	...	...	...	...	971,622	...	...	...	...
Increase compared...	1919	...	...	10,456	3,485	2,191	44,967	63,449	...	51,047	...	...	50,430	...	...	...
Decrease compared...	1919	11,647	4,647	...	...	...	...	...	57,207	...	...	...	...	...	...	...
Increase compared...	1918	...	...	...	...	...	...	...	...	7,366	...	...	57,730	...	...	...

The freight car accumulations for the week ending August 27 show a further reduction to 70,455, as compared with 74,945 the week before. The report shows a considerable reduction in the number of cars held on account of no bills, but an increase in the number of cars held on account of consignee's inability to unload. The deferred car requisitions

cent of the authorized repair forces are working and that the yard force is 100 per cent. There has been no congestion or accumulation on any lines during the week.

The committee at Portland, Ore., reports normal conditions as to switching service and while the labor situation is normal as far as numbers are concerned, the efficiency of

car and motive power department employees is stated as 90 per cent and that of the yard forces at 80 to 85 per cent.

The New York committee says that 21 solid trains have been made up during the week to speed up operation as much as possible. The Delaware, Lackawanna & Western handled 53 floats at its Hoboken bridges, establishing a record. The New Haven interchanged 530 cars with the Pennsylvania on one day, which is the maximum number delivered in any one day since April 1. A total of 507 empty open top cars were moved via float to the Delaware, Lackawanna & Western from the New Haven to relieve the westbound situation on that road. Several consignees have been embargoed for failure to unload promptly. A total of 149 embargoed cars were disposed of. A further modification of embargoes on all lines permits practically a free flow of freight into the terminal and switching service is practically normal. A total of 471 bad order cars were repaired on Sunday. Several roads have experienced difficulty in getting their repair forces to work on Sunday. The labor situation continues to improve as a general proposition, but one line is still experiencing occasional trouble with strikers interfering with the men employed.

The Louisville committee reports that the movement of solid trains, of such commodities as pass through the terminal in sufficient volume to justify it, is being given special attention and the practice of classifying interchange movements before delivery to connections also serves to reduce switching service and minimize terminal detentions. There is no shortage of switching power.

The Kansas City committee reports 38 solid trains of freight moved during the week. No embargoes were in effect restraining freight for that terminal. Switching service at industries has been practically normal. A total of 11,531 cars was repaired during the week of August 28, as compared with 10,644 the preceding week. Individual cases of slow unloading involving 102 cars were taken up with a view of securing prompt release. The supply of equipment furnished for all commodities by all lines serving the terminal was 67 per cent of the requirements.

The Omaha committee reports business being handled currently. The car supply for grain is about 75 per cent of the requirements.

The Philadelphia committee reported a normal number of switching crews in service on all roads. The campaign by all roads to release equipment by having cars unloaded Saturday afternoon and Sunday was continued and a total of 804 cars were unloaded, 467 by railroad forces and 337 by individual consignees.

The Twin Cities committee reports a marked improvement in transportation conditions, much of which is due to increased efficiency of the employees, which has been very marked during the past three or four weeks. The committee says that all employees are doing from 13 to 20 per cent better work than two months ago.

The Cincinnati committee reports that about 600 cars a day have been repaired at that terminal.

Germ Process of Compounding Oils

PAPERS on "The Theory and Practice of Lubrication" by Henry M. Wells and James E. Southcombe, of the Henry Wells Oil Company, London, Eng., were read in London and Pittsburgh* recently. The authors explain the rationale of the superior lubricating properties of fatty oils and of oils compounded with fatty oils over "straight" mineral oils (i. e., mineral oils not compounded). This property has hitherto been mentioned by various observers but left in that

*London paper read before the Society of Chemical Industry, Feb. 2, 1920. Pittsburgh paper read before the National Petroleum Association of America, April 22, 1920.

position. This led to an examination of the principles on which lubrication depends. It was demonstrated that liquids which wet solid surfaces are lubricants, while liquids which do not wet them are not lubricants; that one property which differentiates them is largely that of capillarity, or interfacial tension; that the fatty acids in fatty oils perform the functions of lubrication and not the fatty oil *per se*. It was also found that if the fatty acid be extracted from a fatty oil it is little if any better than a mineral oil as a lubricant, and that if a fatty acid in small quantities be added to mineral oils, their lubricating properties are very appreciably enhanced. Results in the laboratory were confirmed by several independent authorities.

On the practical side, the authors cite many examples where fatty oils or oils compounded with fatty oils have been entirely and successfully replaced in actual practice by "Germ Process" oils for lubrication of steam engines, gas and oil engines and many types of mechanism. Results of trials of marine engine oil on a large scale over 18 months, by the British Admiralty, were cited. "Germ Process" oils are cheaper than fatty compounded oils, and are suitable for the heaviest work in all climates.

The title "Germ Process" selected by the authors is purely arbitrary—chiefly from the fact that hitherto engineers and chemists have had an aversion for the word "acid" connected with any oil. The authors not only dissipated that fear by proving it was grounded on a complete misapprehension of its functions, but proved that the feared fatty acid was a very useful ally when its functions are understood and controlled, which, it is stated, the "Germ Process" ensures. The claim is made that by this method of preparation superior oils can be obtained at a fraction over the cost of mineral oils. The "Germ Process" is the subject of patents in America, in the United Kingdom and in Europe.

Anti-Rust Compound Resists High Temperature

WHILE STATISTICS are not available, the total waste due to the rusting of machinery, tools, ordnance and metals amounts probably to millions of dollars annually. Many iron and steel products exposed to the weather and dampness rust away to a mere shell and become worthless. Many other machines and machine parts requiring bright polished working surfaces are a total loss when these surfaces become rusted in shipment.

Various rust preventives invented and used from time to time have been more or less efficient in specialized fields. For example, paint is a most effective covering for products exposed to the weather. Paint cannot be used, however, on working surfaces and is difficult to remove. For bright polished steel surfaces, some compound in the form of a heavy oil or grease is commonly used.

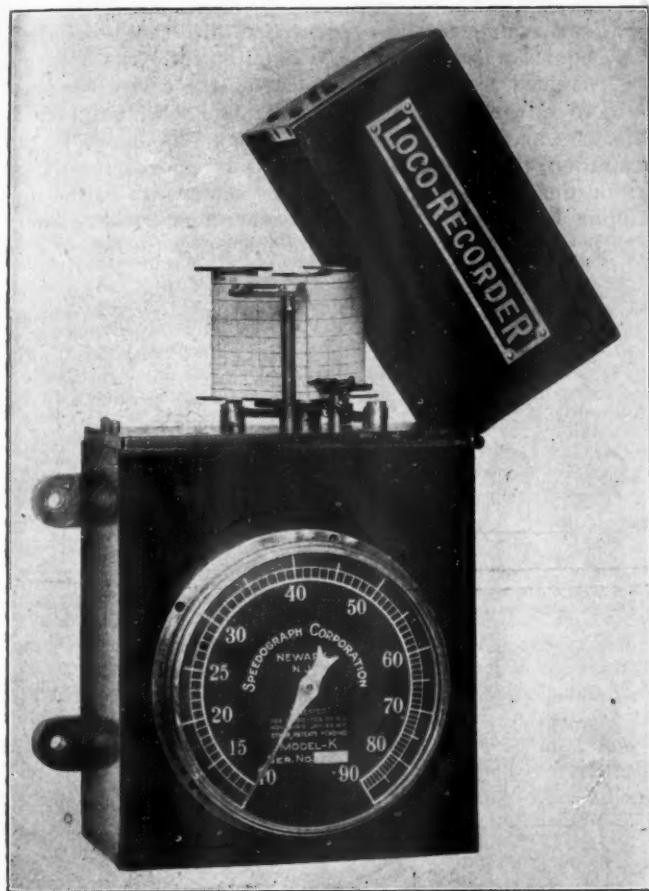
Experience with these compounds has developed the need for three inherent characteristics. First, they must form a protective covering and not melt easily. Under commercial conditions of storage and shipment, temperatures of 70 deg. F. to 100 deg. F. or higher are common, and petroleum and other greases and compounds flow and drip off at these temperatures, exposing the bright surfaces to rust when the temperature has lowered and moisture collects on the metal. Secnd, they must be easily removed. Obviously a length gage, accurate to within .0001-in., cannot be covered with a compound that requires the application of emery cloth to remove it. The third requirement is ease of application.

A rust preventing compound called Stazon, which is said to fulfill these three requirements has been developed recently by the Conversion Products Corporation, New York. It is easily applied and removed by the simple act of wip-

ing, and being an inert compound will not flow at high temperatures. To demonstrate this fact a large number of trade paper editors recently were invited to witness a demonstration. Four samples of anti-rust compounds, including Sta-zon, were placed on a metallic plate, the temperature of which was gradually raised by means of an electric resistance coil mounted on the back. The first compound started to melt at approximately 80 deg. F. and at 115 deg. F. three of the compounds had melted and completely run from the plate. Sta-zon remained and did not begin to soften until the temperature had reached over 200 deg. F., a temperature higher than would be found in any ordinary conditions of storage or shipment. It was stated that this compound when applied to metallic surfaces formed a coating impervious to moisture or atmospheric fumes.

Locomotive Recording Instruments

TWO INSTRUMENTS designed to increase the efficiency of operation of road and yard locomotives by affording a detailed record of speeds and stops have been developed and placed on the market recently by the Speedograph Corporation, Newark, N. J. These instruments, called Loco-Recorders, are durable machines that have been in use long enough to show up any inherent defects and al-



Device for Use on Passenger Locomotives

low them to be corrected. Loco-Recorders are made in models *K* and *L* for road and switcher service respectively.

Recorder for Road Locomotives

The model *K* instrument, illustrated, gives a permanent record of locomotive speed, direction of motion, whether forward or backward, and the time spent at station and other

stops over an entire division. Lost time cannot be made up by dangerous speeds without leaving a tell-tale record for the superintendent, and this practically eliminates danger of excessive speed on curves, or at other points where there are speed restrictions. Unnecessary wear and tear on motive power, rolling stock and tracks through express train speeds of locomotives built for slow and heavy service also are prevented.

Part of the instrument is built on the plan of a speedometer connected by a crank arm and flexible shaft to a rear driving wheel, the speed indicator pointer being actuated by the centrifugal force on a suspended brass ring. Other parts of the instrument consist of a clock, speed and time pencils and an arrangement to drive the recording tape. The recording tape moves at the rate of half an inch to the mile, in keeping with the speed of the locomotive, and is calibrated horizontally in miles per hour and perpendicularly in miles of track.

The speed pencil moves across the tape in proportion to the speed of the locomotive and returns to zero at every stop, acceleration and deceleration being plainly shown. The action is positive and every change of speed is instantly indicated on the dial and recorded on the tape. The mechanism is so interlocked that the recorded speed and the speed shown to the engineer are identical. The time pencil, actuated by the clock, moves back and forth across the tape in 10-min. strokes. When the train is in motion this pencil makes an angular line, the angle depending on the rate of speed, and when the tape stops it makes a straight vertical line, the length of which shows the duration of the stops on the basis of 3/16 in. per min. The dial pointer is the only working part of the instrument exposed to observation. The cover of the case encloses the recording mechanism and tape and can be securely locked to prevent tampering.

By adjusting the tape to a keyboard representing the division over which the train has operated, the speeds at stations, sidings and all points having speed restrictions will be clearly shown; also the location and duration of all stops and slowdowns. The need for this information has long been felt by operating men, and it is stated that engineers trying the device have found it a material aid on account of the speed indicating feature.

Loco-Recorder for Switchers

For use on switchers, the model *L* Loco-Recorder has been developed, which differs from the model *K* instrument mainly by the elimination of the speed indicating mechanism, not needed at slow speeds. A clear and complete performance record of switcher locomotives is afforded, including the time in hours and minutes that a switcher is idle, the time in hours and minutes that it is working, the distance in miles actually covered and the speed of operation at any point or at any time.

An odometer automatically records the exact mileage, registering every 35 ft., and can be set back to zero at the end of the day, week or month as desired. The recording tape is calibrated in minutes and drawn past the time pencil at the rate of 4 in. per hour. The pencil moves up and down when the switcher is in motion, the distance across the tape, 1 3/16 in. in length, representing one-half mile. The angle of these lines and their relation to the minute marks show the rate of speed, broken lines indicating reverses. When the engine is idle the pencil remains stationary and makes a straight horizontal line on the tape, and the total idle time is thus easily calculated.

Since speed indications on a switcher are not required, the instrument can be attached to any convenient part and is not necessarily placed in the cab. The water-tight cover, which has to be raised for the removal and insertion of tapes, is securely locked and this prevents any interference

with the recording mechanism. Several model *L* Loco-Recorders have been applied under actual service conditions and it is stated that the result has been a material increase in the efficiency of switcher operation.

Elevator Controllers

THE ENTIRE LINE of direct and alternating current elevator controllers manufactured by The Cutler-Hammer Manufacturing Company, Milwaukee, Wis., has been replaced by a new line of controllers of fewer types and simpler construction for intermittent elevator service. Although the new controllers retain the general design of the previous ones, they have in addition the following main features: standardized carbon-to-copper power contacts, which are non-freezing and quiet in operation; and time limit acceleration by a simple dashpot relay, which is accurate in operation and provides smooth acceleration under all loads.

With direct current equipments, acceleration is effected by cutting resistance out of the armature circuit. The time interval allowed the motor to come up to speed is determined by the setting of a dashpot relay which is externally adjustable for time valves, and when once set will always cut the resistance out of circuit in the same length of time. The relay consists of a magnetic solenoid which actuates a plunger moving in an oil dashpot, as shown in the illustration.



Direct Current Elevator Controller with Time Limit Acceleration for Slow Speed Elevators

tion which is a view of a small controller for use with slow speed elevators. As the plunger moves upward, upon closing the pilot circuit, it rotates a rocker arm carrying a series of fingers, which cut out the resistance step by step in the controller and cause the accelerating magnet switches to close one by one.

The resistor, which was automatically inserted in the solenoid circuit in the former controllers, has been omitted, as the coil is of sufficient size to prevent overheating on intermittent duty, without having to reduce the current when the plunger reaches the end of its stroke.

The dashpot is totally enclosed, preventing oil leakage or splashing, and has an exterior adjusting screw for time regulation. A special dashpot oil is provided, with a viscosity which varies only slightly over wide ranges in temperature, a test conducted with this relay from 30 deg. to 90 deg. F., without changing the dashpot adjustment, showing variation in the time of less than 10 per cent.

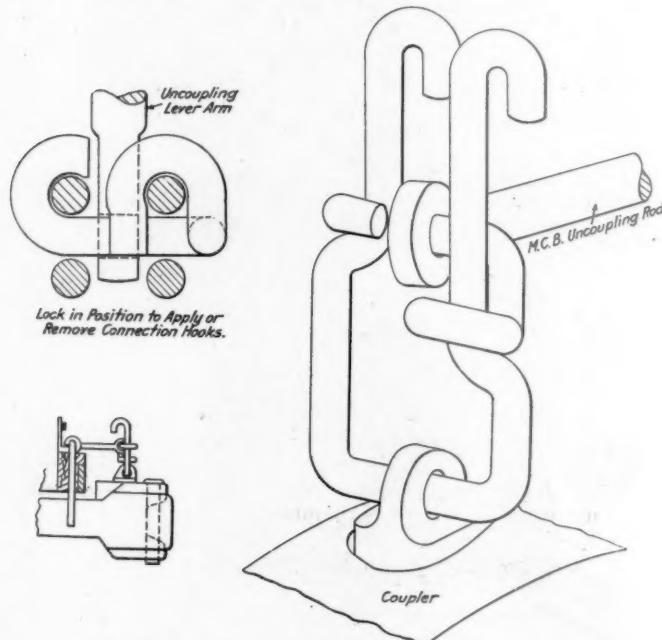
The elevator controller illustrated, consists of a main line contactor and timing relay, mounted on a slate panel and carried on a wall type frame, and is controlled by a reversing switch, which is operated from the cage by wheel, lever or rope. The magnetic main contactor on the control panel has carbon-to-copper contacts and a strong magnetic blowout. It makes and breaks the main line circuit, thus relieving the reversing switch of that duty. The series field of the motor cut out in one step after starting and the design is such that the motor can be reversed only when all the starting resistors are in circuit.

The reversing switch has the fingers inverted with reference to the former design. This makes the terminals readily accessible when the cover of the switch is removed, and the copper dust from the contacts falls to the bottom of the switch without danger of causing a short-circuit between poles.

A controller of the same type designed for heavier duty has magnetic accelerating switches in the motor circuit, and the dashpot mechanism is used as a pilot relay. Similar improvements have been effected on the direct current full-magnetic controllers for operation by car switch or push buttons and on all types of alternating current elevator controllers.

Release Connection for Car Couplers

A CAR COUPLER release connection that can be applied quickly to any M. C. B. coupling lever has been invented recently and a patent on the device has been issued to Edwin Jones, passenger car foreman, Baltimore & Ohio passenger station, Cleveland, Ohio. As shown in the illustration, the connection is applied or removed simply by turning the lock fully over, when the center arm of the uncoupling lever is raised up to the connection hooks. There is no prying open or closing up of open eyes, hooks, or any



Easily Applied Coupler Release Connection

other parts and the device can be applied or removed as many times as desired without weakening or destroying it. The E. D. J. O. coupler release connection, as it is called, is stated to be reliable, durable and efficient in action. Its simplicity and ease of application will be appreciated by car repairmen who have been used to the older types of connection.

General News Department

Fire in the yard of the Pittsburgh & Lake Erie at Pittsburgh, Pa., on September 2, destroyed three Pullman cars and one other passenger car; estimated total damage \$80,000.

A hearing was held at Washington on September 8 before members of the United States Railroad Labor Board on a number of cases involving grievances of employees of the American Railway Express Company.

Regular mail service by airplane was begun on Wednesday of this week between New York and San Francisco. The time of leaving New York is 4:30 a. m., eastern time, and the scheduled time across the continent in 56 hours, 30 minutes. This speed, if maintained, will shorten the time of transit, as compared with railroad carriage, about 40 hours. The air line distance is something less than 3,000 miles. Near Morristown, N. J., September 1, two air-mail-service fliers were killed in the fall of their machine, one of these being Max Miller, the oldest aviator in the mail service.

The telegraph department of the Chicago, Rock Island & Pacific has organized a society for the purpose of giving every interested employee an opportunity to extend and broaden his technical knowledge of the telegraph and telephone, and to acquire a thorough understanding of the best operating practices for the handling of this class of communication. Papers are to be presented by the members on various timely subjects and the best thoughts and ideas are to be gathered by the superintendent of telegraph for printing and furnished to the members for reference.

The appointment of a receiver for the Brotherhood of Railroad Trainmen and an accounting and distribution of the brotherhood's trust fund, estimated at \$10,000,000, has been asked by Benjamin Callahan, head of the Columbus Yardmen's Association, in a suit recently filed at Columbus, Ohio. The suit was filed by Mr. Callahan as an individual policyholder. However, it is believed to be an act on the part of Chicago Yardmen's Association which precipitated the recent "outlaw" strike of yardmen. The petition asserts that all members of the brotherhood expelled for participation in the recent strike have been deprived of a share in the trust fund which they helped to create.

The Treasury Department, partly because of the large payments which must be made to the railroads under the government's guaranty for the six months' period from March 1 to August 31, has announced an issue of \$400,000,000 of Treasury Certificates of indebtedness. In a letter explaining the issue, the Secretary of the Treasury says that the net current deficit for July and August is due chiefly to actual cash payments, amounting to some \$130,000,000, made necessary by the provisions of the transportation act in connection with the return of the railroads to private control; and that according to the latest estimates, payments on account of railroads will probably continue on a large scale during the balance of the present calendar year; and will be relatively heavy during the month of September.

Cincinnati Railway Club

At a meeting of the Cincinnati Railway Club on September 14, J. A. Morris, chairman of the Cincinnati Operating Committee, will present a paper on Transportation. An entertainment will follow the meeting and luncheon will be served.

Canadian Railway Club

J. D. Altmas, assistant general superintendent of car service of the Canadian Pacific, will present a paper on Car Records and Their Relation to Transportation and Accounting at the September 14 meeting of the Canadian Railway Club.

St. Louis Railway Club

The next meeting of the St. Louis Railway Club will be held on September 23. Methods of standardizing track work will be discussed by Earl Stimson, chief engineer of maintenance, Baltimore & Ohio, while J. B. Strong, Chairman of the standardization committee of the Manganese Track Society, will present a paper on manganese construction in track work. Delegates to the convention of the Roadmasters' and Maintenance of Way Association will be entertained by the club, club.

National Association of Railroad Commissioners

The National Association of Railway and Utilities Commissioners will hold its thirty-second annual convention at Washington, D. C., on Tuesday, Wednesday, Thursday and Friday, November 9, 10, 11 and 12. The call for the meeting, just issued, is signed by Walter A. Shaw, president; James B. Walker (New York City), secretary, and D. N. Lewis, chairman of the executive committee.

The usual committee reports will be presented, and, in addition, two afternoon sessions will be devoted to informal discussions of street railway questions, the gas problem and the enforcement of service standards. The circular says that the Association has no quarrel with federal regulation of railroads, within its proper limits, but it resents the efforts of those who seek to curtail the rightful powers of the sovereign states over strictly interstate matters.

New York Railroad Club Meeting

The New York Railroad Club has arranged a unique program for its meeting in the Engineering Societies building on Friday evening, September 17. The program will be divided into four parts, each section dealing with one of the recommendations made by the Association of Railroad Executives to increase the efficiency of operation and meet the present transportation crisis. Each one of the four speakers will devote 12 minutes to making constructive suggestions, or in describing methods which have given unusual success in helping to reach the standards which have been established. The four subjects and speakers are as follows:

1. There should be an average daily minimum movement of freight cars of not less than 30 miles per day. A. J. Miller, chairman of the New York Committee on Car Service.
2. Freight cars should be loaded to an average of not less than 30 tons per car. J. W. Meredith, general superintendent, Central Railroad of New Jersey.
3. Bad-order cars should be reduced to a maximum of four per cent of the total number of cars owned. J. C. Fritts, master car builder, Delaware, Lackawanna & Western.
4. There should be an early and substantial reduction in the number of locomotives unfit for service. F. H. Hardin, chief engineer of motive power and rolling stock, New York Central.

International Railway General Foremen's Association

The sixteenth annual convention of the International Railway General Foremen's Association was held in Chicago on August 7, 8, 9 and 10. The address of welcome, on the opening day, was delivered by Robert Quayle, general superintendent of motive power and machinery of the Chicago & North Western. In his address, Mr. Quayle emphasized the importance of the general foreman's job to the railroad and to the nation. He called attention to the fact that the ton-mile cost of moving freight on American roads is the lowest of any country in the world, Japan ranking second. Continuing, he stated that while our labor costs averages about \$1,600 per year per man, Japan's is only \$174, which is an indication of the efficiency of American methods and American

railroad men. He stressed the importance of the part the foreman plays in producing this result because of his close contact with the details which in the aggregate make up the final result. In speaking of conditions which have caused the present comparatively low productivity of labor, Mr. Quayle stated that it was his opinion that much of the unrest which has been so common for some time past was due to causes for which the men cannot be held wholly responsible, and that the recent wage increase has removed the dissatisfaction so far as most of the men are concerned. He stated in closing that increased production must be obtained through the general foremen, who must exert a steady pressure on the men to get back to pre-war conditions of output.

New Produce Terminal Proposed at Chicago

A new wholesale fruit and produce terminal will be built in Chicago, if plans, now being formulated by the Produce Terminal Company Trust, composed of many of the larger produce firms now located on South Water Street, Chicago, materialize. Because of street improvements in Chicago, a portion and perhaps all of the produce business which is now confined to South Water street will have to be conducted elsewhere and the Produce Terminal Company Trust has formulated plans for the re-location of the business which will be presented to the city council this fall in the form of an ordinance seeking the approval of the project.

The territory under consideration as the new wholesale market covers approximately 20 acres lying between the Chicago, Rock Island & Pacific tracks on the east, Stewart avenue on the west and Archer avenue on the south. The property is now owned by the Atchison, Topeka & Santa Fe.

In addition to the wholesale fruit terminal, the plan also provides for the construction of an outside yard where cars of produce coming into Chicago can be assembled and moved into the central market. By the utilization of such a yard, the cars scheduled for re-shipment to other cities will not be brought into the yards of the central market but will be held in the outer yard for transfer.

According to the promoters of the plan, the wholesale terminal will be accessible to all of the railroads entering Chicago on an equal basis and for that reason they believe that little trouble will be experienced in obtaining the approval of all the railroads involved. The location of the outside yard has not yet been made public.

Outlaw Yardmen Institute Campaign of Sabotage

The "outlaw" Chicago Yardmen's Association and the United Enginemen's Association are now directing a campaign of sabotage against the railways operating in and around Chicago, according to railway officers in that district. During the past few weeks yard engine crews have been attacked and their engines turned loose on several occasions, men who have taken the places of strikers have been "slugged," the children of members of the "outlaw" organization who have gone back to work have been boycotted by their schoolmates, the wives of the men who have taken strikers' places have been terrorized and rooming house keepers in districts adjacent to the terminals have been warned that they must not permit any "strike-breakers" to room in their houses under penalty of bombing.

On August 30, the crew of a yard engine belonging to the Chicago Junction were driven from their engine, which was later turned loose under steam. After running a few miles, narrowly missing a passenger train in its course, the engine was stopped. On September 1, a freight engine belonging to the Chicago, Rock Island & Pacific was "captured" and turned loose. A collision with a passenger train was averted only because a switch engine crew overtook and stopped the engine. On September 2, again, a yard engine belonging to the Chicago, Milwaukee & St. Paul was stolen and run for a mile and a half through the Chicago yards and was stopped only when the steam pressure gave out.

In addition to these depredations a long list of yard workers who have been slugged and robbed has been compiled by railway executives who have requested the aid of both federal and city authorities.

A canvass recently conducted by a local newspaper indicates that the "outlaw" strikers intend to wage a guerrilla

warfare against the railroads by continuing the stealing of engines and the slugging of yard employees. On the other hand it was reported that employees in various terminal yards have started to raise a fund to employ "sluggers" to retaliate. Unless steps are taken to police the yards properly it is believed that the Chicago terminals will become the battle ground for gang fighting and that the operation of the terminals will be seriously interfered with.

Railway Returns for June and Six Months

During the first six months of 1920 the Class I railroads had a net operating income of \$7,336,531, as compared with \$156,086,467 in the corresponding period of 1919. This figure is arrived at, however, after charging into the January revenues approximately \$50,000,000 of back mail pay, after the payment of \$11,874,385 for war taxes since March 1, which were not included in the 1919 expenses, and after only \$25,462,027 of the increased wages resulting from the decision of the Railroad Labor Board retroactive to May 1 had been charged to the expenses. For the month of June the roads had a deficit of \$16,284,900 as compared with a net operating income in June, 1919, of \$52,000,000. For the half year the railroads in the Eastern district had a deficit of \$80,000,000, while the roads in other districts had net operating income as follows: Pocahontas District, \$7,871,000; Southern District, \$16,629,000; Western District, \$63,469,000. The summary as issued by the Interstate Commerce Commission for the roads of the United States is as follows:

	June		Six months	
	1920	1919	1920	1919
1 Aver. miles operated	235,501.40	234,199.64	235,003.51	234,181.24
2 Revenues:				
3 Freight	339,092,726	284,326,360	1,855,632,757	1,612,424,574
3 Passenger	107,824,929	105,634,362	567,010,780	543,710,851
4 Mail	8,043,564	4,303,349	101,188,699	25,803,129
5 Express	12,337,278	10,068,796	74,391,590	52,845,980
6 All other transportation	13,125,701	11,002,015	67,893,551	57,638,162
7 Incidental	12,996,762	10,390,343	68,422,394	60,692,119
8 Joint facility—Cr.	552,578	544,364	3,461,347	3,269,192
9 Joint facility—Dr.	198,350	179,639	1,079,586	993,529
10 Railway operating revenues	493,775,188	426,089,950	2,736,921,532	2,355,390,478
Expenses:				
11 Maint. of way and structures	95,102,230	66,300,018	451,492,366	371,005,985
12 Maint. of equipment	127,120,900	96,675,119	710,551,463	573,065,963
13 Traffic	5,752,517	3,828,585	31,250,481	22,445,005
14 Transportation	230,607,147	176,067,702	1,279,141,318	1,042,769,783
15 Miscel. operations	5,527,330	4,130,692	28,434,512	22,414,018
16 General	14,179,186	9,960,052	74,834,024	61,425,960
17 Transportation for investment—Cr.	326,020	554,721	1,657,975	3,025,246
18 Railway operating expenses	477,963,290	356,407,447	2,574,046,189	3,090,101,468
19 Net rev. from railway operations	15,811,898	69,682,503	162,875,343	265,289,010
20 Railway tax accruals	25,685,254	14,552,249	131,640,747	92,130,856
21 Uncollectible railway revenues	80,638	72,620	526,447	365,661
22 Railway operating income	d9,953,994	55,057,634	30,708,149	172,792,493
23 Equipment rents (Dr. balance)	4,598,540	1,653,735	13,851,217	9,509,762
24 Joint facility rent (Dr. balance)	1,732,366	1,265,436	9,520,401	7,196,264
25 Net of items 22, 23 and 24	d16,284,900	52,138,463	7,336,531	156,086,467
26 Per cent of expenses	96.80	83.65	94.05	88.74

c—Credit.

d—Debit.

Exhibitors at the Tool Foremen's Convention

The following is the list of railway supply and manufacturing companies exhibiting at the tenth annual convention of the American Railway Tool Foremen's Association, held at the Hotel Sherman, Chicago, September 1 to 3 inclusive:

Abrasive Co., Chicago.—Grinding wheels. Represented by F. M. Willis and W. P. Corratt.

Air Reduction Sales Co., New York.—Acetylene tanks and torches. Represented by H. H. Melville and R. T. Peabody.

American Machinist, New York.—Represented by F. D. Wheeler.

Armstrong-Blum Mfg. Co., Chicago.—Band saws, steel machine saw, continued punch shear and bender. Represented by H. J. Blum and F. A. Blum.

Armstrong Bros. Tool Co., Chicago.—Rachet drills, tool holders, wrenches and lathe dogs. Represented by J. C. Fletcher and Horace Armstrong.

Besley & Co., Charles H., Chicago.—Taps and reamers. Represented by C. A. Knill.

Blancke Co., Inc., L. C., Taunton, Mass.—Twist drills, reamers and cutters. Represented by J. A. Farrell.

Borden Co., Warren, Ohio.—Beaver stocks and dies, Beaver square and pipe cutters. Represented by H. R. Williams and V. M. Gaspar.

Boss Nut Co., Chicago.—Lock nuts. Represented by J. A. MacLean, J. W. Fogg and A. MacLean.

Brown & Sharpe Mfg. Co., Providence, R. I.—Precision instruments. Represented by H. C. Clayton, H. J. Johnson, R. E. Doras and P. A. Topel.

Brubaker & Brs., W. L., Chicago.—Taps, dies and reamers. Represented by J. R. Smith.

Bullard Machine Tool Co., Bridgeport, Conn.—Represented by Mr. Marshall and Mr. Huschart.

Carborundum Co., Niagara Falls, N. Y.—Represented by E. P. Ritzma, W. E. Knott, H. P. Frost and J. W. Frazer.

Chicago Pneumatic Tool Co., Chicago, Ill.—Represented by C. W. Cross, J. L. Canby, C. E. Leverenz, R. C. Black, J. L. Crowley, J. D. Crowley, N. S. Thulin, Mr. Cooke, Mr. Lynch and T. J. Smallwood.

Clark Equipment Co., Buchanan, Mich.—Twist drills. Represented by H. G. Tuttle and C. O. Montague.

Cleveland Steel Tool Co., Cleveland, Ohio.—Punches, dies, rivet sets and chisel blanks. Represented by H. W. Leighton, G. H. Knebusch and F. F. Frey.

Cleveland Twist Drill Co., Cleveland, Ohio.—Twist drills and screw extractors. Represented by H. S. White and O. B. Hansen.

Colonial Steel Co., Pittsburgh, Pa.—Crucible tool steel. Represented by C. O. Sternagle, W. H. Duley, W. W. Shaw, Thos. E. Tietz and Robt. Pinshingham.

Crerar, Adams & Co., Chicago.—Jacks, die starters, wrenches, Lidseen's oilers. Represented by Russel Wallace, W. I. Clock, J. A. Martin, Geo. Bassett, E. W. Koon, Chas. Gregory and E. C. Pohlner.

Crucible Steel Co. of America, Pittsburgh, Pa.—Represented by F. Baskerville and J. H. Jones.

Detroit Twist Drill Co., Detroit, Mich.—Drills. Represented by H. T. Scott.

Duff Mfg. Co., Pittsburgh, Pa.—Jacks.

Grip Nut Co., Chicago.—Lock nuts. Represented by J. B. Whitenack.

Hisey-Wolf Mfg. Co., Cincinnati, Ohio.—Represented by J. B. Wells and R. W. Wells.

Hyland Company, R. H., Chicago.—Jacks. Represented by H. O. Norton, George R. Law and R. D. Bates.

Imperial Belting Co., Chicago.—Belting. Represented by A. G. Pickett and W. G. Willcoxson.

Independent Pneumatic Tool Co., Chicago.—Pneumatic and electrical tools. Represented by W. A. Nugent, Paul Mitchell, E. E. Lampe, J. C. Cowell, R. S. Marsh, H. White and H. C. Halbert.

Industrial & Railway Supply Company.—Twist drills, reamers and hack saws.—Represented by R. B. Jones, A. C. Muchter and E. E. Hart.

Ingersoll-Rand Co., New York.—Pneumatic tools. Represented by L. W. Schrutzer, H. H. Drew, C. H. Lungren, T. G. Abrams, W. D. Goddard and H. D. Pearson.

Jackman & Co., E. S., representing Firth Sterling Steel Co., McKeesport, Pa.—Represented by Carl O. Erick.

Keller Pneumatic Tool Co., Grand Haven, Mich.—Pneumatic tools. Represented by J. C. Campbell, W. Kelly, J. C. Willson, Edw. Biederman, W. Delaney and Mr. Breunen.

Liberty Steel Products Co., Inc., Pittsburgh, Pa.—Portable drill press and countersinker, single line torch, portable rivet heater, pneumatic dolly bar and heading attachment. Represented by G. L. Degenhard.

Lovejoy Tool Works, Chicago.—Boiler makers tools, flue expanders, flue cutters, chuck, Perfection pneumatic trip. Represented by W. H. Dangel and Tom Brown.

Ludlum Steel Co., New York.—Carbonizing pots. Represented by S. T. Parsons, C. J. Poore, J. E. Poore and M. F. Hall.

Midvale Steel & Ordnance Co., Philadelphia, Pa.—Represented by John Last.

Modern Tool Co., Erie, Pa.—Chucks, self-opening die heads and threshing tools. Represented by R. H. Wood and C. B. Buxton.

Norton Co., Worcester, Mass.—Represented by G. W. Thomson and H. K. Clark.

Onondaga Steel Co., Inc., Syracuse, N. Y.—Represented by H. A. Shier, G. E. Avery and W. N. Pomeroy.

Oxweld Railroad Service Co., New York.—Acetylene equipment. Represented by Wm. A. Champieux, J. P. Nicholson, F. C. Hasse and R. Rivett.

Racine Tool & Machine Co., Racine, Wis.—Machine saws. Represented by F. J. Kidd, D. B. Maxwell and Wm. Rhinehart.

Railway Mechanical Engineer, Chicago, Ill.—Represented by J. C. Marsh and C. B. Peck.

Rivet Cutting Gun Co., Cincinnati, Ohio.—Represented by J. C. Little and F. L. McCune.

Scully, Jones & Co., Chicago.—Wear Ever production tools. Represented by W. G. Salkeld and B. H. Lloyd.

Simmons Mfg. Co., Philadelphia, Pa.—Metal cutting saws, files, tool bits. Represented by Geo. R. Bird and H. P. Bauman.

Street & Co., R. R., Inc., Chicago.—Wrenches, chucks, ball bearing pulleys, hangers, Hyatt roller bearings. Represented by A. I. Clemen, F. H. Jones and A. H. Taylor.

Tool Salvage Co., Detroit, Mich.—Salvaged tools. Represented by H. H. La Vercombe and M. F. Crawford.

Vanadium-Alloy Steel Co., Pittsburgh, Pa.—Vanadium steels. Represented by O. H. Dallman, R. F. Noonan and A. G. Henry.

Wayne Tool Mfg. Co., Waynesboro, Pa.—Reamers, drills and taps. Represented by J. C. Campbell.

Whitman & Barnes Mfg. Co., Akron, Ohio.—Twist drills and reamers. Represented by M. J. Kearins, K. Grant and J. A. Dilger.

Williams & Co., J. H., Brooklyn, N. Y.—Wrenches, tool holders, lathe dogs, pipe wrenches. Represented by P. E. Thomas and W. C. Teare.

Traffic News

Ships moving through the Panama Canal in August numbered 300, and tolls paid amounted to \$936,209. This is the largest monthly record ever reported.

The railroads of New York state—all of the principal companies—have joined in a petition to the Interstate Commerce Commission asking for an investigation of the intrastate rates recently ordered by the Public Service Commission of the state, with a view to securing a decision on the question whether the Interstate Commerce Commission (where, as in the present case, intrastate rates are fixed by state authority on a basis much lower than rates for interstate transportation, over the same lines, declared reasonable by federal authority), may, under the Transportation Act of 1920, require intrastate rates to be advanced.

Owners of wagon coal-mines in Pennsylvania, Indiana, Kentucky and other states at a hearing before Division No. 4 of the Interstate Commerce Commission on September 4 protested against the recent order of the commission giving priority in the use of open top cars to mines equipped with tipplers, which deprives the wagon mines of a large part of their car supply. They denied that the loading of cars from wagon mines has resulted in undue delay in the use of cars and characterized the commission's order as discriminatory and unjust. They also asserted that delay in the use of cars is largely due to the practice of railroads in giving railroad mines a week's supply of cars in advance.

Plans for providing Northern Ohio cities with a supply of coal for domestic use were agreed upon at a conference held at Cleveland on September 3 by committees representing the Northern Ohio cities, coal operators, railroad officers and the Interstate Commerce Commission, in accordance with a plan suggested at the hearing before the Commission last week, at which the chambers of commerce of Cleveland and Akron complained that domestic consumers were being discriminated against by the commission's priority order for lake coal for the Northwest. The coal operators' committee pledged the operators to furnish sufficient quantities of coal for domestic consumers, to be distributed by a local committee without interfering in any way with the operation of Service Order No. 10.

The Chicago, St. Paul, Minneapolis & Omaha, the Great Northern, the Minneapolis, St. Paul & Sault Ste. Marie, and the Northern Pacific have joined in a petition to the Interstate Commerce Commission stating that there is a difference of opinion between them and the Great Lakes Transit Corporation as to the proper division to be allowed the lines east and south of Lake Superior ports of the through rates on grain products shipped by mills in Minneapolis and St. Paul via Duluth, Superior or Itasca, in connection with the Great Lakes Transit Corporation's boats to Buffalo and east thereof. The commission is asked to issue an order requiring the continuation of the present proportion of 23½ per cent of the New York rates for the lines south of Duluth, Superior or Itasca from the opening of the season of navigation.

Coal Production

A partial recovery from the depression of the previous week carried bituminous coal production during the week ended August 28 to a total of 11,374,000 net tons, an increase of 326,000 tons, or 3 per cent, over the output of the week before, although still 439,000 tons short of the output attained in the second week of August, according to the weekly bulletin of the United States Geological Survey. Preliminary reports indicate a substantial increase in total production on Monday and Tuesday of the following week. Production during the first 205 working days of the year has been 347,406,000 net tons, which is 15½ million tons less than that of 1917 and 40½ million tons less than that of 1918, but 49½ million tons ahead of the production of 1919. Cumulative shipments of anthracite coal since the beginning of the coal year April 1 now stand at 36,579,000 net tons, a slight

decrease when compared with the preceding year. During the week ending August 21 the average loss of full-time output attributed to transportation was 24.3 per cent. Dumpings of bituminous coal at Lake Erie ports during the fifth week of operation of the amended lake order, of the Interstate Commerce Commission established a new high mark for the present season, a total of 1,278,065 net tons. The cumulative lake movement from the opening of the season now stands at 11,009,000 net tons, as against 16,867,000 in 1918 and 16,174,000 in 1919. The cumulative shipments from the mines under Service Order No. 10 to September 1 were 14,943 cars in arrears. Cars of bituminous coal dumped over tidewater piers during the week ended August 28 totalled 26,116. Considerable quantities of coal shipped under Service Order No. 11 for New England have not been dumped for lack of vessels at the ports. On August 30 the coal on hand at Hampton Roads consigned to New England was reported as 126,000 net tons, whereas the capacity of vessels available for loading this coal was only 8,400 tons.

Rates to Be Increased in Canada

The Board of Railway Commissioners for the Dominion of Canada, at Ottawa, on September 7, announced an order authorizing a general increase of freight rates, on the railroads of Eastern Canada, of 40 per cent; and an increase of 35 per cent on the lines in Western Canada.

The rates are to go into effect on September 13, and be in force until December 31; but beginning with 1921 the rates in Eastern Canada must be only 35 per cent above those now in effect, and in Western Canada only 30 per cent above.

Authority is granted to make a general increase in passenger rates of 20 per cent, but with a maximum rate of four cents a mile. The 20 per cent increase may be charged until the end of this year; and thereafter the rates must be only 10 per cent above those now in force, and on July 1, 1921, fares must be reduced to the rates now in force.

Rates for accommodations in sleeping and parlor cars are allowed to be increased 50 per cent; excess baggage rates 20 per cent.

Rates for the transportation of coal are dealt with in a separate section.

Intrastate Freight Rates

The fight between state regulatory bodies and the railroads over the legality of the intrastate rates lower than the rates recently authorized by the Interstate Commerce Commission is now centered in Chicago. On September 8 Commissioner B. H. Meyer opened hearings on the request of the railroads operating in Illinois for the setting aside of the recent ruling of the Illinois Public Utilities Commission, which allows increases in Intrastate freight rates of only 33 1/3 per cent and denies the application of Illinois roads for increases in passenger rates comparable with the increases granted on interstate travel.

At the first session the railroad systems centering in Illinois introduced testimony purporting to show that the ruling of the State Public Utilities Commission preventing the interstate passenger rate granted to carriers by the Interstate Commerce Commission from becoming effective in intrastate traffic is discriminatory both as to individuals and localities. P. S. Eustis, passenger traffic manager of the Chicago, Burlington & Quincy, testified that the state ruling prevented the carriers from charging 3.6 cents a mile in Illinois operated to the disadvantage of cities just over the border of the state and to the advantage of competing cities just inside the state line.

He cited several instances to show the effect of the ruling and upon questioning stated that he believed the public would take advantage of this situation. The railroads in Illinois already have obtained a temporary injunction against the Public Utilities Commission restraining it from enforcing the Illinois law. The Utilities Commission maintains that the state has jurisdiction over the rates within the State while the railroads say that the Interstate Commerce Commission's order supersedes this.

An attempt of the state to obtain a continuance of the hearing until October 21 failed. It is believed that the hearings will take five or six days after which the evidence presented will be placed before the Commission sitting as a whole. Railroad attorneys expect a ruling within 60 days.

Commission and Court News

Interstate Commerce Commission

The hearing in the export bill of lading investigation set for Washington for September 20 before Commissioner Woolley has been cancelled, and hearings will be held at Chicago on that date and at Washington on October 4.

The Interstate Commerce Commission has further suspended from September 9, to October 9, certain tariff schedules that seek to cancel joint through rates on sugar subject to a minimum carload weight of 36,000 lb. from California producing points to various western points.

The Commission has permitted the National Council of Traveling Salesmen's Associations to become a party to the complaint of the Order of Commercial Travelers against the Pullman Company, protesting against the 20 per cent increase in Pullman rates which went into effect on May 1.

The Commission, in the case of the Northern Iowa Traffic Association vs. the director general and the railroads, has decided that class freight rates between points in Official Classification territory east of the Indiana-Illinois state line and points in Northern Iowa have not been shown to be unreasonable or unduly prejudicial.

The Commission on September 3 issued its decision, by Commissioner McChord, in the electric railway mail pay case, ordering increased rates for the different classes of mail service performed by the electric railways, on a space-basis system, and providing that side, terminal and transfer service shall be assumed by the Postoffice Department, or paid for on ascertainment of the cost.

I. C. C. to Investigate New York Fares

The Interstate Commerce Commission, on petition of the New York Central and other railroads operating in the state of New York, has ordered an investigation to determine whether the rates required by the New York Public Service Commission, which refused to put into effect for interstate travel the increases in passenger fares allowed by the Interstate Commerce Commission as to interstate traffic, cause or will cause any undue or unreasonable advantage, preference or prejudice as between persons or localities in intrastate commerce on the one hand and interstate and foreign commerce on the other hand, and as to what rates should be charged by the petitioners as to intrastate traffic in New York in order to remove any advantage, preference, prejudice or discrimination found to exist. A hearing was assigned before Chief Examiner Wilbur La Roe, Jr., on September 13 at New York. This order supersedes the order entered by the commission on July 12 providing for an investigation of the alleged discrimination caused by the attempt to enforce a statutory 2-cent fare on the New York Central. The New York railroads in their petition allege that the observance of the state commission's order to put into effect the statutory 2-cent passenger fare throughout the state will result in unjust and unreasonable discrimination against interstate commerce. A similar petition had previously been filed by the Illinois roads and a hearing was set for September 8. Another somewhat similar petition has been filed by the Texas roads and others are in course of preparation.

Reconsignment and Diversion Rules

The Interstate Commerce Commission has rendered a decision on fifteenth section applications proposing certain additional uniform reconsignment rules and increased charges which are approved in the following particulars:

1. Reconsignment of l. c. l. shipments of freight should be permitted when forwarded in one car from one station on one day by one shipper on one bill of lading, for delivery to one consignee at one destination, and the revenue paid thereon is not less than charged for the following minimum quantities: On butter, eggs, cheese, dressed poultry, game, and all other perishable com-

modities for the movement of which in l. c. l. quantities refrigerator or ventilator cars will be furnished under the tariffs, and for the movement of which a refrigerator or ventilator car is actually used, 15,000 pounds; on all other freight in ordinary cars, 24,000 lb.

2. The rule proposing that shipments reconsigned where back hauls or out-of-line hauls are involved will be subject to the published rates to and from the points of reconsignment plus reconsignment charge of \$5, is found justified in so far as it concerns reconsignment involving back hauls, except that when such a shipment has not been placed for unloading at the reconsignment point the charge should be the through rate plus the published local or other rates applicable to the back-haul movement in both directions and the reconsignment charge. The proposed rule in so far as it concerns out-of-line hauls where through rates apply from original point of origin to final destination via point of reconsignment is found not justified.

3. Rule proposing that shipments covered by "order" or "order notify" bills of lading placed on hold tracks awaiting surrender of bill of lading, or shipments which are placed for inspection of contents before delivery, and which necessitates subsequent movement of car to place of delivery, will be considered as reconsignments within the switching limits before placement and subject to the provisions and charges in rule 8; this is found justified, provided that surrender of original bill of lading shall not be a condition precedent to the placement of the car or to the giving of the order designating where car shall be placed for unloading, except that where place of delivery designated is other than the local team tracks original bills of lading must be surrendered or indemnity bonds executed in lieu thereof, or other satisfactory assurance given carrier.

4. Rules proposing on shipments of fruits and vegetables at points in western and southern classification territories, one free reconsignment at the through rate and two additional reconsignments at the through rate plus reconsignment charges; and in official classification territory generally, two reconsignments at the through rates plus reconsignment charges, found justified.

Supplemental Report in Rate Case

Supplementing its original report in the general rate advance case, the Interstate Commerce Commission has authorized the railroads to increase rail-lake-and-rail rates between points on the Atlantic seaboard and interior points, on the one hand, and St. Paul and Minneapolis, Minn., and points grouped therewith, on the other, upon the same basis as is applied to corresponding rates to and from Duluth, Minn.

It has been the practice of railroads serving the eastern group, in conjunction with certain boat lines operating on the great lakes, to publish joint rail-lake-and-rail rates between points along the Atlantic seaboard and numerous interior eastern points, on the one hand, and Chicago, Duluth, Minneapolis and St. Paul, and the other western points on the other. In its original report, the commission found that in the construction of rail-and-lake rates the present parity between Chicago and Duluth should be maintained. It authorized an increase of 40 per cent in the rates between eastern points and Chicago, the Duluth rates to be made on the Chicago basis. Minneapolis and St. Paul are in the western group, and the carriers were authorized, under a literal interpretation of the original report, to increase the Twin Cities' rates $33\frac{1}{3}$ per cent, the basis generally approved for interterritorial traffic. Attention has been directed to the fact that the rail-lake-and-rail rates to and from the twin cities bear a close relation to the corresponding rates to and from Duluth. The Duluth rates and the Twin Cities' rates are highly competitive, are published in the same tariffs, governed by the same classification, and, the commission says, it would obviously be not inappropriate to provide the same percentage of increase for both.

The present rail-and-lake class rates from New York to Duluth and the corresponding rates to the twin cities are as follows:

Classes:	1	2	3	4	5	6
New York to Duluth.....	102 $\frac{1}{2}$	91	69	48 $\frac{1}{2}$	41	34 $\frac{1}{2}$
New York to twin cities.....	123 $\frac{1}{2}$	109	82	56 $\frac{1}{2}$	48	39 $\frac{1}{2}$

Differentials 21 18 13 8 7 5

The above differentials were the result of the findings in *Commercial Club of Duluth v. B. & O.*, 27 I. C. C., 639. To increase the Duluth rates by 40 per cent and the twin cities' rates by $33\frac{1}{3}$ per cent

per cent would slightly reduce the differential on some of the lower classes, although there has been a substantial increase in Duluth's inbound and outbound rates since 1913, when the last-mentioned case was decided.

The commission is convinced that a literal application of its original report will operate to the undue disadvantage of Duluth. The findings are, therefore, modified so as to authorize the same percentage increases in the twin cities' rates as were approved for the rates to and from Duluth.

Transcontinental Freight Rates

The Interstate Commerce Commission on September 3 made public the proposed report of Examiner W. A. Disque in the case instituted by the Intermediate Rate Association against the director general and the railroads, recommending that the commission find that commodity freight-rates in general applying to so-called intermountain territory from all the country east of the Rocky Mountains are not unduly prejudicial to that territory or unduly preferential of the Pacific Coast cities, but that it require joint through class rates to be established from points in Official Classification territory, the Atlantic Seaboard, Buffalo-Pittsburgh and Cincinnati-Detroit territory, to Boise, Idaho; Missoula, Mont.; Salt Lake City, Utah; Cheyenne, Wyoming and Albuquerque, N. M. A proposed scale of such rates is included in the report. The rates to these points are now combination rates based on the Missouri river or St. Paul.

This latest transcontinental rate case, involving all class and commodity rates to the Pacific coast and the intermountain territory from all points east of the Rocky mountains differs from previous rate cases in that the present rates are not lower to the coast than to the intermountain territory. The situation is now reversed, the question being whether lower rates shall be accorded to the intermountain territory than to the coast. On March 15, 1918, all departures from the long and short haul rule in westbound rates were removed by order of the Interstate Commerce Commission, on the ground that water competition was no longer a compelling force and the class rates were already lower to the intermountain territory than to the coast. In the spring of 1918 representatives of the intermountain shippers approached the Railroad Administration on the question of graded rates on all commodities; and, after a hearing had been accorded them by the Western District Traffic Committee of the Railroad Administration, the matter was referred to a joint committee of members of the San Francisco and Portland district freight committees, with directions to work out and submit a complete system of graded rates. This coast committee submitted the plan to the Western district committee with recommendations to the director general of railroads and the director general and the director of the division of traffic, on a visit to Spokane, indicated that graded rates would be accorded. However, the Chicago committee failed to act on the recommendations and the director general took the matter out of its hands and referred the question to the Interstate Commerce Commission for recommendations. The request was later withdrawn (shortly before the railroads were relinquished) but at the suggestion of the director of traffic the case was brought before the Interstate Commerce Commission by the filing of a formal complaint by the Intermediate Rate Association, a voluntary association of shippers' organizations and state commissions. The complaint alleged that the Pacific Coast had been given unreasonable preference because graded rates had not been accorded the intermountain country. Class rates were in general satisfactory. The plan proposed by the coast committee would satisfy the complainants but the director general and the railroads opposed it vigorously; and, after the chief examiner of the commission had considered it impracticable, a committee of railroad officers was appointed to prepare a proposal including the readjustment the railroads would be willing to make. This proposal was submitted in December, 1919, with the understanding that it was primarily on behalf of the railroad corporations, who were about to resume operation of their properties. It contemplated a complete readjustment of class and commodity rates, giving effect to the grading principle but entailing a disruption of important commodity-rate relationships and suggested the cancellation of many commodity rates. Further hearings were held during May, 1920; and the rates have now been increased $33\frac{1}{3}$ per cent

by the order of the commission in the general rate advance case.

The examiner finds that the intermountain territory is now paying the same rates on most of its traffic from the East as is paid by the Pacific Coast, in spite of a difference in distance ranging from 250 to 800 miles. The complainants asked an entire disregard of water competition, whereas the Pacific coast interests urged that the rates be not graded down on the ground that the rail rates to the coast should be such as to provide an adequate movement of loaded cars westbound to take care of eastbound shipments from the coast; and that water competition would return. Therefore they contended that reasonable rates should be fixed for the intermountain territory without tying them to the coast rates. The railroads supported this position and asked that the complaint be dismissed, saying that their plan of revision had been submitted only because they were asked to propose a plan.

The conclusion of the examiner is that the allegations of the complaint as to discrimination and unreasonableness have not been sustained; that there is no undue prejudice in the rates to intermountain territory as a whole, and that he cannot say that the rates should be graded. There is sufficient water transportation now and sufficient indication that it will increase to cause a belief that in a short time it will be felt in a serious loss of tonnage by the rail lines unless they have in force appropriate measures to meet the situation. The examiner, however, recommends that the complainants' allegations with respect to the combination basis of class rates from Official Classification territory to intermountain territory be sustained and that joint through class rates should be established at figures named in an appendix.

"We are almost inclined to say," the examiner says, "that our conclusion with respect to class rates may be taken as a general disapproval of combination rates. Methods of rate-making that are relics of the dark ages of rate-making should be discarded. The combination basis is abnormal, unnatural, unscientific, discriminatory and, some may say, un-American. The carriers should be regarded more and more as one national system and the time may not be far distant when we should proceed to the establishment of joint through class and commodity rates substantially lower than the combination of locals between practically all points in the country. We have generally recognized that through rates should be less than the combinations; but, prompted chiefly by considerations of paramount public interest growing out of the revenue conditions of certain carriers, we have hesitated and even declined to absolutely condemn combinations. We are now vested with sufficient authority to initiate rates that will protect the revenues of the carriers; and where carriers will suffer depletion of revenues by reason of the establishment of new joint rates, that loss can be offset by slight increases in other rates, or in the general level of rates."

Court News

Government Cannot Withdraw N. P. Lands

The Circuit Court of Appeals, Ninth Circuit, holds that under the land grant to the Northern Pacific of July 2, 1864, the company on completion of its road became vested with a contract right to select non-mineral lien lands within the indemnity limits, and the government could not defeat this right by withdrawing for possible inclusion in a national forest reservation any of the lands within those limits subject to selection before their survey. —U. S. v. N. P., 264 Fed. 898.

Notice of Injury to Drover Essential to Recovery

The Circuit Court of Appeals, Ninth Circuit, holds that the clause of a drover's contract made part of a bill of lading of an interstate shipment of livestock, providing that the railroad should not be liable to the caretaker for any injury growing out of the railroad's negligence unless given written notice of the claim within 30 days after injury, is a condition of recovery and not an exemption from or limitation of liability. It is immaterial that the railroad had actual notice of the injury and through its agents sought, without success, a settlement, where the amount of the claim was never stated, even orally, by the plaintiff or by any representative of his.—Gooch v. Oregon Short Line, 264 Fed. 664.

Foreign Railway News

British Freight Rates Increased

LONDON, August 13.

Announcement has just been made of the increases in freight rates by the Ministry of Transport for Great Britain which will take effect on September 1. This latest revision is to supersede the increases imposed on January 15 last, which were reported in the *Railway Age* of February 20 on page 575. This latest increase raises the rates and charges 100 per cent above pre-war figures plus a flat rate increase. They are of an interim character and are provided for the purpose of meeting, together with the recent increase in passenger fares, the £54,500,000 (\$270,000,000 approx.) deficit anticipated for the period ending July 31, 1921.

Whereas the increase put into effect last January varied from 25 to 60 per cent, according to the class of traffic, above pre-war rates, the new rates represent an all round increase of 100 per cent plus flat rate additions.

What is known as Class A traffic was increased from 25 to 35 per cent plus a flat rate addition not exceeding two shillings (48 cents) per ton in January last. The new rates call for a flat rate addition of four shillings (96 cents) per ton, including a 100 per cent increase over the pre-war rates. Class B traffic was increased 40 per cent in January with a flat rate of 3 pence (6 cents) per ton and the new rates call for 100 per cent plus flat rate of 6 pence (12 cents) per ton. Class C was increased 50 per cent with 6 pence (12 cents) flat rate in January and this has been raised to 100 per cent plus a flat rate of 9 pence (18 cents) per ton. In Classes 1 to 5 the general increase was 60 per cent plus flat rate of one shilling (24 cents) and the present rates call for increase of 100 per cent with the same flat rate.

With this new increase in freight charges the public of Great Britain are paying, above pre-war charges, 75 per cent on ordinary passenger fares and 100 per cent on freight rates plus something in respect to flat rates. Thus it will be seen that transport charges on railways will be less than double what they were before the war. On the other side—increased cost—the wages bill has increased more than 200 per cent of what it was before the war. This was partly caused by the increase of 23 per cent in working force occasioned by the eight-hour day. The cost of steel rails is nearly four times the pre-war cost. Pig iron costs more than four times and all engineering work generally has increased over three times the pre-war cost. Mr. Neal, parliamentary secretary to the Ministry of Transport, stated that much larger increases would have been required but for the fact that considerable economy in the working of the railways has been effected. As an example he pointed out the fact that 31 per cent more passengers were being carried with 20 per cent less engine power. He said the present increases do not settle what shall be the final method of dealing with transport charges in Great Britain, stating that there might or might not be another revision before the railways were restored to the companies. He said that the charges which were in operation in August of next year, when government possession of the railways ceases, will remain in operation for 18 months afterwards.

FARMERS are begging for cars; that is to say, freight cars. They already have the limousines.—*Minneapolis Journal*.

ONE THING, ABOVE ALL, is to be borne in mind. If the higher rates result, at length, in improved service, they will tend to decrease rather than to increase prices. Transportation costs are a small proportion of the total cost to the consumer. The answer to the pyramiding argument is, not that the railroads should be deprived of living rates, but that pyramiding should be prevented. For the rest, the added cost due to increased rates will not be intolerable. It will be utterly insignificant in comparison with the reduction in price of many commodities which will ensue if distributive methods are improved.—*Baltimore Sun*.

Equipment and Supplies

Equipment for the Short Lines

The American Short Line Railroad Association, Washington, D. C., has worked out the details of a plan for assisting short line railroads to finance the purchase of equipment with the assistance of a loan from the \$300,000,000 loan fund which is being administered by the Interstate Commerce Commission. It has incorporated the Consolidated Railway Equipment Corporation, under the laws of Delaware, with a capital of 10,000 shares of common stock of no par value and 10,000 shares of preferred stock of \$100 par value, to purchase cars and locomotives to be rented to short line railroads under a lease-purchase arrangement or a contract of conditional sale. The corporation will issue \$20,000,000 of 15-year serial equipment trust notes maturing semi-annually, and it is proposed to purchase about 4,000 freight cars and about \$8,000,000 worth of locomotives. The details of the plan are not yet complete and it is not yet known how much of a loan will be obtained from the government, although the Interstate Commerce Commission has tentatively set aside \$12,000,000 of the loan fund for short lines.

Locomotives

THE PHELPS DODGE CORPORATION, New York, has ordered 2 switching locomotives from the H. K. Porter Company.

THE CHINA, JAPAN & SOUTH AMERICAN TRADING CORPORATION, LTD., 80 Maiden Lane, New York, is asking for prices on from 150 to 200 Consolidation type locomotives for export.

THE MANILA RAILROAD, reported in the *Railway Age* of July 25 as inquiring for 30 locomotives, has ordered 10 Mountain type and 10 Santa Fe type locomotives from the American Locomotive Company.

THE ILLINOIS CENTRAL, reported in the *Railway Age* of September 3 as being in the market for 50 Santa Fe type locomotives and 25 switching locomotives, has ordered the 50 Santa Fe locomotives from the Lima Locomotive Works. This is in addition to the 50 Santa Fe type locomotives recently ordered by this road from the same builders, as reported in the *Railway Age* of May 28.

Freight Cars

THE DELAWARE, LACKAWANNA & WESTERN is inquiring for 20 caboose cars.

THE CENTRAL ARGENTINE RAILROAD is inquiring for 194 four-wheel cars of 20 tons capacity.

THE SINCLAIR REFINING COMPANY, Chicago, has ordered 6, 55-ton hopper cars from the Pressed Steel Car Company.

THE DETROIT EDISON COMPANY, Detroit, Mich., has ordered 6, 50-ton gondola cars from the Pressed Steel Car Company.

THE OTIS STEEL COMPANY, Cleveland, Ohio, reported in the *Railway Age* of July 30 as being in the market for 10 hopper cars, has ordered 5, 55-ton hoppers from the Pressed Steel Car Company.

THE INTERNATIONAL RAILWAY SUPPLY COMPANY, 30 Church street, New York, has bought from the Gregg Company 100, 20-ton cane cars and 25, 20-ton flat cars for the American Railroad Company of Porto Rico.

THE CHICAGO & NORTH WESTERN, reported in the *Railway Age* of July 9 as being in the market for 250 refrigerator cars and in the *Railway Age* of July 23 as being in the market for 50 caboose cars, has ordered 250 refrigerator and 50 caboose cars from the American Car & Foundry Company.

Passenger Cars

THE CHICAGO & NORTH WESTERN, reported in the *Railway Age* of August 13 as inquiring for 25 passenger cars, has ordered this equipment from the American Car & Foundry Company.

Supply Trade News

William S. Noble, who has been appointed manager of the railroad department of the Standard Paint Company, with offices in New York and Chicago, as was announced in the *Railway Age* of August 27, page 376, was born at Danville, Ky. He began railway work in 1887 as secretary to vice-president of the Lehigh Valley. He was later assistant in the president's office of the same road, and from 1905 to 1909 was assistant to president of the Seaboard Air Line, the Clinchfield Coal Corporation and the Carolina, Clinchfield & Ohio Railroad at New York. He then was appointed president's assistant with the Lehigh Coal & Navigation Company, Philadelphia, and in 1914 entered the service of the Standard Paint Company, New York, in its railroad department. He subsequently served as western representative, from which position he was recently promoted to manager of the railroad department of the same company.

Charles H. Motsett, superintendent of the New York division of the New York, New Haven & Hartford, with office at Harlem River, N. Y., resigned recently to become general sales manager for the DeMayo Engineering Corporation, designers and manufacturers of portable elevators and conveyors for the handling of bulk material. Mr. Motsett's new headquarters are at pier 62 North River, New York. He was born in Peoria, Ill., on December 4, 1873, and began railway work in 1892 as a yard clerk with the Chicago, Rock Island & Pacific, at Peoria. He subsequently served as chief clerk to the general yardmaster, and during 1902 to 1903 as assistant night yardmaster at Rock Island, Ill., and as assistant general yardmaster. He then served as general yardmaster, Council Bluffs, Iowa, until 1904, and during the next two years served in the same position at Des Moines and at Valley Junction, Iowa. In 1906 he left the service of the Rock Island to become trainmaster at Des Moines, on the Minneapolis & St. Louis, and two years later went to the New York, New Haven & Hartford as trainmaster at Harlem River, N. Y. He subsequently served on the same road from 1913 to 1914 as superintendent of the New York division at Harlem River and then went to the Panama Railroad, where he remained for two years as superintendent at Balboa, Canal Zone. He returned in 1916 and was appointed superintendent of the New London division of the New Haven. From 1917 until his resignation, he served as superintendent of the New York division.



W. S. Noble



C. H. Motsett

Railway Financial News

ATCHISON, TOPEKA & SANTA FE.—This company has applied to the Interstate Commerce Commission for an order authorizing it to continue the issuance of its California-Arizona lines first and refunding mortgage bonds, payable in U. S. gold coin, in an additional amount not exceeding \$15,486 par value, to enable the Atchison Company to effect the exchange of such of \$564,514 par value, of bonds payable in sterling as may from time to time be surrendered for exchange into California-Arizona lines first and refunding mortgage bonds payable in U. S. gold coin.

BOSTON & MAINE.—This company has filed an application with the Interstate Commerce Commission for authority to issue \$3,843,000 6 per cent bonds, maturing June 1, 1920, to refund an equal amount of bonds and notes.

CHICAGO & WESTERN INDIANA.—This company has applied to the Interstate Commerce Commission for authority to issue 15-year, 7½ per cent, collateral trust bonds in an amount not to exceed \$7,500,000 and \$1,000,000 of trust notes for 15 years, with interest at 6 per cent, for the purpose of refunding outstanding obligations.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has applied to the Interstate Commerce Commission for authority to issue \$1,000,000 of general mortgage 4 per cent gold bonds, to reimburse the treasury for expenditures made for improvements, and also a similar amount of first and refunding mortgage bonds to be used as collateral.

DELAWARE & HUDSON.—This company has applied to the Interstate Commerce Commission for authority to issue \$3,475,000 first and refunding mortgage bonds maturing May 1, 1943, bearing interest at 4 per cent and secured by a mortgage to the Farmers' Loan & Trust Company dated May 1, 1908. The proceeds are to be used for the acquisition of property and the construction and completion of extensions and improvements of facilities except that it is desired that part of the bonds may be made available for security for a loan of \$1,250,000 from the revolving fund, which will be used to pay for part of the improvements. These include the elimination of the Whitehall tunnel, \$500,000; a new yard and 30-stall roundhouse at Glenville, \$1,250,000; new yard and 10-stall roundhouse at Port Henry, \$500,000; 25 passenger coaches at \$33,000 each, four combination passenger and baggage cars at \$25,000 each and 15 milk cars at \$20,000 each.

DENVER & RIO GRANDE.—The Western Pacific Railroad is offering to exchange its ten-year 4 per cent notes for the 7 per cent cumulative adjustment bonds of the Denver & Rio Grande. The offer is conditional on its being accepted by holders of \$7,510,000 adjustment income bonds of the Denver & Rio Grande before September 20.

GULF PORTS TERMINAL.—This company has applied to the Interstate Commerce Commission for a loan of \$500,000 to enable it to resume the construction of 26 miles of unfinished line between Pensacola and Mobile, on which the roadbed has been finished for 18 miles, and also for the betterment of 46 miles of road now in operation and the purchase of some additional equipment.

KANSAS, OKLAHOMA & GULF.—This company has filed an application with the Interstate Commerce Commission for authority to issue securities for the purpose of carrying out the terms of the plan of adjustment stipulated in court proceedings by which the applicant company acquired its property.

LONG ISLAND.—This company has been authorized by the Interstate Commerce Commission to execute an equipment trust agreement for \$1,668,000 for 12 years, and \$419,279 of 6 per cent unsecured notes, the proceeds to be used in payment for 20 steel motor passenger cars, 50 steel trailer passenger cars and 30 steel passenger cars.

NEW YORK CENTRAL.—A further hearing was held before W. A. Colston, director of finance of the Interstate Commerce Commission, at Washington on September 7, on the application of the New York Central for authority to issue \$25,000,000 of 7 per cent collateral trust bonds and a like amount of refunding and improvement mortgage bonds to be deposited as collateral. The hearing was called particularly to allow the Michigan Public Utilities Commission an opportunity to be heard in opposition to the power of the Interstate Commerce Commission to supplant the state authorities in the regulation of security issues. No one appeared on behalf of the Michigan commission, but R. J. Cary, of counsel for the railroad, stated that a stipulation had been entered into with the Michigan commission by which it would test the question of jurisdiction in the courts by entering suit against the railroad to recover the penalties provided by the Michigan law for the issuance of securities without having made an application to the state authorities. Director Colston then read into the record telegrams which had passed between the Michigan commission and the interstate commission in which the Michigan commission had asked the Interstate Commerce Commission to request the railroad to apply to the state commissions, as well as to the Interstate Commerce Commission for authority to issue the securities. Commissioner Daniels, of the Interstate Commerce Commission, had replied, saying that the commission has not held that a railroad must apply to the state commissions concurrently with an application to the Interstate Commerce Commission, and that it does not see its way clear to ask the New York Central to make an application to the state authorities. Director Colston asked a number of additional questions regarding the transactions between the railroad and J. P. Morgan & Co., as syndicate manager, and between the Morgan company and the 400 members of the syndicate through which approximately \$39,000,000 of subscriptions were obtained two hours after the books were opened. It had been brought out at the previous hearing that the New York Central received approximately 96.52 for the bonds and that the members of the syndicate received them at 97. Mr. Colston said the record ought to show in some detail as to whether it was actually necessary for the New York Central to pay a commission of 3 or 3½ per cent, and as to whether it could not have placed some of the bonds without the assistance of a syndicate. Mr. Cary pointed out that it would have been entirely impracticable for the railroad to try to sell its own bonds, and that the commission represented a very conservative payment for the services of Morgan & Co., and of the distributing organization represented by the syndicate. A further hearing on these points was set for September 10.

NEW YORK, NEW HAVEN & HARTFORD.—The entire capital stock of the Rhode Island Company, which originally cost the New Haven \$24,000,000 when the company was formed to operate that road's trolley interests in the state of Rhode Island, was sold on September 2, at public auction, for \$2,200. The stock, amounting to 96,855 shares, was purchased by Harry Parsons Cross, of Providence, R. I., who said he was attorney for other interests, which he refused to name.

PARIS & MT. PLEASANT.—Authority has been asked of the Interstate Commerce Commission to issue \$100,000 of receivers' certificates for the purpose of making repairs to roadway, station buildings and equipment.

RICHMOND, FREDERICKSBURG & POTOMAC.—This company has applied to the Interstate Commerce Commission for authority to execute notes aggregating \$250,000 to the First National Bank of Richmond, Va., or to discount a portion or all of \$250,000 of notes of the Richmond Terminal Railway for the purpose of raising funds needed for the payment of retroactive wages under the award of the Railroad Labor Board.

SEABOARD AIR LINE.—Holders of the \$4,000,000 6 per cent notes of 1917 which fall due September 15, 1920, will receive \$750 in cash on each \$1,000 note and \$250 in an extended note due in three years from September 15, with interest at 7 per cent.

VIRGINIA BLUE RIDGE.—This company has applied to the Interstate Commerce Commission for authority to issue a four-months' note for \$8,500.

WESTERN PACIFIC.—See Denver & Rio Grande.

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Railway Officers

Executive

R. M. Shepard has been appointed assistant to the receiver of the Toledo, St. Louis & Western, and assistant to the president of the Detroit & Toledo Shore Line, with headquarters at Toledo, Ohio, effective September 1.

W. S. Andrews, general superintendent of transportation of the Southern Railway, Lines West, with headquarters at Cincinnati, Ohio, has been appointed assistant to the vice-president to give particular attention to car service, with headquarters at Washington, D. C., effective September 1.

Financial, Legal and Accounting

F. B. Sherwood has been appointed auditor of freight over-charge claims of the Illinois Central, the Yazoo & Mississippi Valley, and the Chicago, Memphis & Gulf, with headquarters at Chicago, effective September 1.

Operating

H. C. Brock has been appointed trainmaster of the Slaton division of the Pan Handle & Santa Fe, with headquarters at Slaton, Tex., effective September 1, succeeding H. A. Tait, assigned to other duties.

J. F. Anton, whose promotion to superintendent of the Slaton division of the Pan Handle & Santa Fe, with headquarters at Slaton, Tex., was announced in the *Railway Age* of August 13, (page 299), was born on May 23, 1885, at Hague, Va. Mr. Anton entered railway service with the Baltimore & Ohio as a clerk in yard service in September, 1899. In February, 1905, he was promoted to yardmaster, with headquarters at Baltimore, Md. After a short service with the Missouri Pacific as yardmaster, he entered the employ of the Atchison, Topeka & Santa Fe as a switchman at Pueblo, Colo., in June, 1906. During the latter part of this year he was appointed engine foreman at La Junta, Colo., and not long thereafter was transferred to Las Vegas, N. M. He was promoted to night yardmaster in February, 1907, and then to general yardmaster, a position he held until January, 1913, when he was appointed assistant trainmaster on the Rio Grande division. In June, 1918, he entered the army and upon his return from overseas in August, 1919, was reappointed to his former position. He was transferred to the Plains division in February of the same year, with headquarters at Amarillo, Tex., where he was located at the time of his recent promotion.



J. F. Anton

pointed engine foreman at La Junta, Colo., and not long thereafter was transferred to Las Vegas, N. M. He was promoted to night yardmaster in February, 1907, and then to general yardmaster, a position he held until January, 1913, when he was appointed assistant trainmaster on the Rio Grande division. In June, 1918, he entered the army and upon his return from overseas in August, 1919, was reappointed to his former position. He was transferred to the Plains division in February of the same year, with headquarters at Amarillo, Tex., where he was located at the time of his recent promotion.

H. H. Temple, chief engineer of the Pittsburgh & West Virginia, with headquarters at Pittsburgh, Pa., has been appointed general superintendent of that road and the West Side Belt, with the same headquarters, succeeding J. E. Fairhead, resigned, effective September 1.

D. H. Ryan, assistant superintendent of the Canadian Pacific, with headquarters at St. John, N. B., has been appointed

acting superintendent of the Schreiber division, with headquarters at Schreiber, Ont., succeeding W. C. Guthrie, granted a month's leave of absence, effective August 21.

James B. Finley, assistant general superintendent of the Southern Pacific of Mexico, with headquarters at Empalme, Sonora, Mex., has been appointed general superintendent, effective September 1, succeeding J. H. Temple, deceased. The office of assistant general superintendent has been abolished.

C. T. Beven, secretary and director of the Car Service committee of the American Railroad Association, has been appointed terminal trainmaster of the Illinois Central, with headquarters at New Orleans, La., effective September 1. **E. R. Gunther**, chief clerk to the terminal superintendent of the Illinois Central, has been appointed secretary of the Car Service committee, to succeed Mr. Beven.

C. M. Mitchell, superintendent of the Cincinnati, New Orleans & Texas Pacific, with headquarters at Danville, Ky., has been appointed general superintendent of transportation of the Southern Railway, Lines West, with headquarters at Cincinnati, Ohio, succeeding W. S. Andrews, promoted, and **J. G. Clements**, trainmaster of the Cincinnati, New Orleans & Texas Pacific, at Danville, Ky., has been appointed to succeed Mr. Mitchell, effective September 1.

Traffic

A. B. Bierdeman has been appointed general agent in the freight department of the Toledo, St. Louis & Western, with headquarters at Chicago.

Edward Campbell has been appointed assistant general freight agent of the Bessemer & Lake Erie, with headquarters at Pittsburgh, Pa., effective August 31.

J. H. Shaw, general freight and passenger agent of the Tremont & Gulf, with headquarters at Winnfield, La., has been appointed general freight and passenger agent of the Arkansas & Louisiana Missouri, effective September 1, with headquarters at Monroe, La., and will assume entire charge of all traffic matters previously handled by R. R. Renfrow, auditor.

George Stephen, freight traffic manager of the Canadian National, with headquarters at Toronto, Ont.; **H. H. Melanson**, passenger traffic manager, with same headquarters, **W. G. Manders**, assistant freight traffic manager, and **R. Creelman**, assistant passenger traffic manager, with headquarters at Winnipeg, Man., have had their jurisdiction extended over the Grand Trunk Pacific and the Grand Trunk Pacific Coast Steamship Company, effective August 24. Other officials appointed to represent the Canadian National and the Grand Trunk Pacific lines west of Duluth, Minn., Port Arthur and Armstrong, Ont., are: **A. E. Rosevear**, general freight agent in charge of grain, grain products and livestock, with headquarters at Winnipeg; **J. M. Horn**, general freight agent at Winnipeg, in charge of all traffic not otherwise assigned; **J. M. Macrae**, assistant general freight agent at Winnipeg, **W. Hately**, assistant general freight agent at Winnipeg, in charge of publication of tariffs and divisions; **W. E. Duperow**, general passenger agent at Winnipeg, in charge of the territory east of Lucerne, B. C., and **Osborne Scott**, general passenger agent in charge of territory of Lucerne, B. C., and west, including the Grand Trunk Pacific Steamship Company, with headquarters at Vancouver, B. C. All appointments effective August 28.

Mechanical

John F. Long, district maintenance of equipment inspector of the Baltimore & Ohio, has been appointed master mechanic of the Connellsville division, Eastern district, with headquarters at Connellsville, Pa., succeeding H. J. Burkley, assigned to other duties.

James Simpson, master mechanic of the Northern Pacific, with headquarters at Spokane, Wash., has been promoted to

general master mechanic of the lines west of Paradise, Mont., with headquarters at Tacoma, Wash., effective August 26. **G. F. Egbers**, master mechanic, with headquarters at Pasco, Wash., has been transferred to succeed Mr. Simpson, as master mechanic of the Idaho division, with headquarters at Parkwater, Wash.; **C. A. Wirth**, road foreman of engines, with headquarters at Pasco, Wash., has been promoted to succeed Mr. Egbers.

Henry Wanamaker, who has been appointed district superintendent motive power of the New York Central, with headquarters at Albany, N. Y., as noted in the *Railway Age* of August 6 (page 260), served as superintendent of shops previous to this promotion. Mr. Wanamaker was born on August 5, 1866, at Pottsville, Pa. He received a high school education and began railroad work on August 1, 1884, with the Philadelphia & Reading, as machinist's apprentice. He was promoted to machinist in 1888 and served in that capacity until 1896, when he was appointed gang foreman at Reading, Pa. He left the Philadelphia & Reading in 1900 to become a foreman in the erecting shops of the New York Central at West Albany, N. Y., where he remained until 1905, when he was transferred to Depew, N. Y., as general foreman. In December, 1911, he was appointed superintendent of shops, with the same headquarters, and was transferred to West Albany on May 20, 1912.



H. Wanamaker

Engineering, Maintenance of Way and Signaling

H. B. Holmes has been appointed chief engineer of the Pittsburgh & West Virginia and the West Side Belt, with headquarters at Pittsburgh, Pa., succeeding H. H. Temple, promoted, effective September 1.

R. A. Sheets, assistant signal supervisor of the Chicago terminal division of the Chicago & North Western, with headquarters at Chicago, has been promoted to signal supervisor of the West Iowa, the Sioux City and the Northern Iowa divisions, as well as lines west of the Missouri river, with headquarters at Boone, Ia.

A. R. Jones, supervisor tracks of the New York Central lines east of Buffalo, with headquarters at Clearfield, Pa., has been appointed division engineer of the St. Lawrence division, with headquarters at Watertown, N. Y., succeeding **P. H. Winchester**, transferred to the Syracuse division, with headquarters at Syracuse, N. Y., effective September 1.

C. L. Spaulding, whose promotion to district engineer, Eastern district of the New York Central, with headquarters at New York, was announced in the *Railway Age* of July 16 (page 128), was born at Fitchburgh, Mass., on March 27, 1867. Mr. Spaulding began railroad work as a chainman for the Fitchburgh Railroad in March, 1893, and served subsequently as a rodman and instrument man until 1899, when he left that road to become assistant engineer of the Boston & Maine, leaving that road in 1903 to go with the New York Central & Harlem River as assistant engineer. In May, 1906, he was appointed resident engineer and was transferred twice while acting in that capacity. In February, 1919, he was appointed secretary and engineer on the Yonkers Waterfront Commission, with headquarters at Yonkers, N. Y. In July, 1919, he was promoted to district engineer of the electric zone and remained in this position until his recent promotion to Eastern district engineer, as already noted.

Boynton S. Voorhees, who has been appointed general office engineer of the New York Central Lines, with headquarters at New York, as announced in the *Railway Age* of July 16 (page 128), was born at Hackensack, N. J., on April 29, 1886, and was graduated from the Sheffield Scientific School of Yale University in 1907. He entered the employ of the New York, New Haven & Hartford Railroad the same year as a chainman at New Haven, Conn., being made inspector in 1908. In the latter part of 1908 Mr. Voorhees left the New Haven and went with the New York Central as a chainman and rodman in the maintenance of way department, being located at Albany, N. Y. From April, 1909, to January, 1912, he was draftsman, transitman and inspector in the construction department at Watertown, N. Y., particularly in charge of field work of the new five-mile freight cut-off location and construction. In January, 1912, he was promoted to assistant engineer in the office of the district engineer of the construction department at Albany, N. Y., and in May of the same year he was transferred to New York as assistant engineer of grade crossing. In 1916 he was promoted to engineer of this work and in February, 1920, was appointed district engineer of the Eastern district at New York, from which position he was appointed general office engineer, as noted above.

Railroad Administration

John Sesser, former assistant general superintendent of the Great Northern, has been appointed a member of Railway Board of Adjustment No. 3 of the United States Railroad Administration, with office at Washington, D. C.

Obituary

Isaac B. Thomas, purchasing agent of the northwestern region of the Pennsylvania, with headquarters at Chicago, died September 1 in that city. Mr. Thomas was born on June 26, 1872, at West Chester, Pa. He graduated from Sheffield Scientific School, Yale University, in 1892. His first railroad work began in 1892 as apprentice at the Altoona shops of the Pennsylvania. On August 1, 1897, he was promoted to inspector at the same shops. In April, 1899, he was transferred as inspector to the office of the assistant engineer of motive power at Altoona. He was appointed assistant master mechanic, with headquarters at Renovo, Pa., on February 1, 1900, but returned to Altoona in 1901 as assistant engineer of motive power. On August 1, 1903, he was appointed master mechanic at the Pittsburgh shops and transferred to the Altoona machine shops in 1906. He was promoted to superintendent motive power, Erie division of the Pennsylvania, and also of the Northern Central, with headquarters at Williamsport, Pa., in 1911. He was appointed assistant purchasing agent of the Pennsylvania, lines east of Pittsburgh, in 1916. Upon the return of the road to private control he was appointed to the position he held at the time of his death.



I. B. Thomas

William H. Moore, engineer of structures of the New York, New Haven & Hartford, with headquarters at New Haven, Conn., died in that city on September 5.

THE NASHVILLE TRAFFIC BUREAU has petitioned the Tennessee Railroad Commission to disapprove advanced rates, recently filed, for switching cars in Nashville.